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Lachesis and Nemesis: four chapters on the human condition in the writings of Carl Linnaeus

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Preface

According to Plutarch Lachesis was the third of the Sisters of Fate. She joined Generation and Destruction in the sublunar world. Nemesis, on the contrary, was a daughter of Tyche. Mythical thought in late Hellenic times saw in these goddesses an expression of Natural and Divine necessity dominating human life.

Carl Linnæus conceives Lachesis and Nemesis as symbols behind realities included in his views about human life and conduct. How he regarded *Lachesis naturalis* and *Nemesis Divina* is the subject of the present study. If it requires an apology it is that the secret of a genius always remains hidden to posterity that can never arrive at a final solution. Even at its best, the result may be, as Pliny said, "only some shadows of the truth" (*Hist. nat.* XXX, 6).

It is rather astonishing to find how much has already been said about Linnæus, and how much remains to be said to give us something deeper than the mere outlines of his personality. Thanks to the painstaking and meticulous work of the late librarian Arvid Hjalmar Uggla, M.D. and Ph.D., of Upsala new ways opened up for the study of the intellectual and scientific stature of this great naturalist of eighteenth-century Sweden. Well aware that my approach will not be the final word concerning these questions, I dedicate the following pages to the memory of my old friend Arvid Hj. Uggla. After his death a colleague of his, the librarian Dr. Ingrid Odelstierna of Upsala has with the greatest kindness rendered me considerable assistance.

These studies were made possible only with the aid of the Donner Institute for Resarch in Religious and Cultural History, connected with Åbo Akademi. My heartfelt thanks go therefore to the magnificient Patronage of this Institution, and to members of its staff, especially Dr. Sixten Ringbom and Mrs. Siv Storå. For several years the libraries of the University of Upsala and of the Swedish University of Åbo have assisted me in my efforts to gain an insight into these materials. My friend, T. Fredbärj, M.D., of Stockholm, well-

known for his Linnean research, has given me his tireless assistance at all times. The manuscript was given its shape in English by kind assistance of Mrs. Geraldine Hultkrantz of Stockholm. For further help I beg to thank Professors Åke Hultkrantz, Stockholm, Sten Lindroth and H. W. Donner, Upsala.

The origins of these essays on Linnæus are to be found more than ten years ago in an investigation of Swedish folklore in the 18th century and of the learned and popular traditions mirrored in Linnæus' writings, both published and unpublished. It was then found that Linnæus' ideas of natural magic were intimately connected with his opinions of the natural condition of man and divine retribution in this life. Behind his philosophical dietetics opened up a large vista whose outlines, though somewhat blurred, could yet be traced in science and the reflections on man, preserving the influence of the Renaissance and the Baroque.

In this manner four essays came to be written on four widely disparate topics, i.e. Linnæus' learning and ideas of magic, the elements of folklore in his writings, his moral and social attitudes and the philosophical background. The Reader will find connecting lines in the Introduction and Conclusion.

For the benefit of the reader it seems necessary to add some remarks about what is not fully referred to in the footnotes. Carl Linnæus, ennobled von Linné, was born on May 23rd, 1707, at Råshult, Småland, and died on January 10th, 1778, as Professor of Medicine and Botany at the University of Upsala. After the death of his son, Carl von Linné the younger, the collections, manuscripts and books passed into the possession of The Linnean Society in London, where they are still preserved. Several important works out of his considerable production have been posthumously edited, for instance the Journal of his Lappland journey in 1732 in a standard edition by Thore M. Fries. Bibliographically Linnæus' production is listed by M. Hulth. The great bulk of Linnæus' lecture notes on the Dietetic from the time of his professorship was edited in 1907 by A. O. Lindfors for the Faculty of Medicine at the University of Upsala (*Lachesis naturalis*, cited here as *LN*). Photostatic copies of the unedited parts of these manuscripts are deposited in the University Library of Upsala. These have been deciphered by Dr. Arvid

Hj. Uggla, and the copies were put at my disposal in 1959. These manuscripts are here referred to as *LN*-MSS. An early series of Linnæus' lecture notes on the Dietetic entitled *Diæta naturalis 1733* (here abbreviated *DN*) was edited by Arvid Hj. Uggla in 1958 for the Swedish Royal Academy of Sciences. The collection of Linnæus' personal notes, entitled by himself *Nemesis Divina*, are preserved in the University Library at Upsala. A selection of these notes, edited by Elias and Thore M. Fries (second edition Upsala 1878), has been used by the present author. The title is abbreviated *ND*.*

For biographical and bibliographical purposes the reader may be referred to Thore M. Fries' standard work of 1906. A short guide in English is given by Sten Lindroth in *Swedish Men of Science* (Stockholm 1952). A study by the same author, has recently appeared in *Lychnos*, 1965–1966, pp. 56–122, Upsala (with a summary in English). Works by Knut Hagberg and Elis Malmeström may also be mentioned. The Yearbook of the Swedish Linnean Society (*Svenska Linné-sällskapets årsskrift* abbreviated *SLSÅ*) is a very important source of information about Linnæus' life and traditional background.

Åbo, Finland
November, 1967

K. Rob. V. Wikman

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* The new edition of *Nemesis Divina* by Elis Malmeström and Telemak Fredbärj 1968 could not be considered in the text. The reader may recur to the cited pages in the manuscript. Earlier editions by Knut Barr, 1923, and Knut Hagberg, 1960, follow mainly Fries.

Introduction

To penetrate Linnæus' scientific and social thinking will always be a hard task. The core of his personality will in more than one respect always remain hidden, even unattainable to us, and his position within his particular sciences, botany and medicine, is very often difficult to decide because of their mutual dependence on contemporary thought. The scientifically fruitful years of Linnæus lasted for about three decades centering around the early summer's day in Holland in 1735 when as an unknown Swedish student he woke up and found himself a renowned savant. In the late 1740s his original vein in science began to peter out. As the prominent Swedish physician, Professor Robin Fåhræus remarks, the enormous intensity in his work caused him to be worn-out early.[1] When the Småland students harangued him in the end of 1749 their speaker, Samuel Krook, expressed grave concern for his weak health.[2] During the subsequent decades Linnæus nevertheless pursued his career in a rather miraculous way. From the viewpoint of Linnæus' early years, we must, however, look to the period of Enlightenment and backwards to the centuries of the Baroque and Renaissance.

The great Linnean bicentenary of 1907 heralded the edition of the then known sections of Linnæus' lecture notes on dietetics, written during the time of his professorship and entitled by him *Lachesis naturalis*. To Linnæus' own notes were added a number of class-notes made by his pupils. The editor, A. O. Lindfors, gave the collection the title *Linnés dietetik* ('Linnæus' Dietetic').[3] Some time afterwards another considerable portion of the *Lachesis* notes was found amongst Linnæus' posthumous notes preserved by the

[1] Robin Fåhræus, *Till 250-års minnet av Linnés födelse*, *Nordisk Medicin* 1957: 57: 731, p. 24.

[2] Samuel Krook, *Urshults pastorats inbyggares seder, 1749*, ed. by N. Werner, Växjö 1922, p. 49.

[3] *Inbjudning till medicine doktors promotionen.* (Invitation to the conferring of the Degree of M.D.) Uppsala 1907.

Linnean Society in London. These have not been published although they possess an interest extending far beyond the history of medicine. From more than one point of view the Royal Swedish Academy of Sciences was certainly well-advised to bring about the publication of the earlier collection of notes, *Diæta naturalis*, in connection with the Linnean Jubilee of 1957. With unsparing pains and tireless energy the prominent Linnean scholar, Arvid Hj. Uggla, accomplished in 1958 the incredibly difficult task of sorting out and preparing for the press these notes, the contents of which had hitherto been almost unknown.[1] They were originally dated by Linnæus 1733, but they form a running series, and the actual time of their conclusion can only be determined by the date of the appearance of the *Lachesis* notes. In the latter the earlier notes have been revised and gradually enlarged. The relationship between the earlier and the later notes on dietetics is at present obscure, and it offers many intricate problems for future biographers. These problems depend, to a certain degree, upon the fact that the separate entries in the *Lachesis* folios have been made at different dates during the period between 1742 and 1772, when Linnæus, as professor, lectured no less than eight times on dietetics. Dr. Uggla makes the assumption that the manuscript written in Linnæus' youth was definitely laid aside in the first-mentioned year, but even this cannot be stated with full certainty.

Every scholar who is confronted with the many difficulties which arise when he uses these Linnean notes, is soon overwhelmed by a sense of uncertainty and uneasiness of mind when he tries to elucidate the problems of Linnæus' personality and learning, even when confined to the purposes mentioned here. Much must remain presumptions or guesses in accordance with some given *lignes de faits*. The very interpretation of the Linnean modes of expression, generally in a lapidary style and in a literary language, consisting of Swedish and Latin, presents great problems, even for a student who is relieved from the countless difficulties in the original manuscripts. Without the excellent, meticulously accomplished preliminary labour of

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[1] Caroli Linnæi *Diæta naturalis 1733*. På uppdrag av Kungliga Svenska Vetenskapsakademien, utgiven av Arvid Hjalmar Uggla, Uppsala 1958. (Commissioned by the Royal Swedish Academy of Sciences, edited by Arvid Hj. Uggla, June 5th 1957.) Cf. Arvid Hj. Uggla, *Linné och dietetiken. Levnadsteckningar över K. Svenska Vetenskapsakademiens ledamöter* 152. Sthlm 1958.

Dr. Uggla the latter difficulties would have been an insuperable task for the present author.

A short quotation from an autobiography by Carl Linnæus may introduce our account of his Dietetic. He says that he conceives the discipline as "an experimental Dietetic founded on experiences and examples quite in accordance with the manner in which the newer physicians are treating their science and have made her experimental. Herewith all matters, occurring in *vita communi*, are alleged as proofs". Not without pride did Linnæus uphold his empirical methods. The manner of presenting his material is revealed by the headings *Theses* and *Scholia*. The health-maxims are contained under 136 headings with their accompaning comments (*scholia*).[1] The first fifty paragraphs were extended to seventyone, and complete the original version. Several insertions of a later date may nevertheless be observed. The latter parts of the manuscript are arranged by the editor in the same way. Much points to the assumption that these later notes were partly written after Linnæus' visit to Holland during the years 1735–38. Obviously this applies to those sections of the *Diæta* which will especially occupy us in the following. In the *Lachesis*-MSS these parts bear the heading *Animi pathemata.*

It is uncertain in what sequence and to what extent the *Lachesis* folios were used for the lectures, and also what Linnæus was actually saying on each separate occasion. Considering Linnæus' strange ways of working, similar doubts exist when it comes to the relative dating of the collection of notes or single notes.

Diæta naturalis and *Lachesis naturalis* show evidence of the author's intention to present them in a final literary form. Linnæus could, however, never mould these manuscripts into a form which satisfied his maxim: *ordo anima scientiarum.*[2] In the middle of the 1760s, however, Linnæus seems to have intended preparing the lecture-notes for publication. We presume that at this time he also composed the Prolegomena for the intended

[1] In *Diæta* the principal parts here considered are numbered as sections 105–106, 111, 114–115, 123–125, 133, 135. In the *Lachesis* manuscript they are headed *Spectra, Manes, Sympathia, Magia* and *Superstitiones* (folios 16–21 according to Dr. Uggla's numbers on the photostatic copies in the Library of Upsala University). Notices about diseases, fate, idiosyncrasies, idolatry and similar things are entered in the preceding folios of the manuscript 7–11.

[2] *DN*, p. 179.

work. It is possible that the title-page of the *Lachesis* originated at the same time.

The title recommends itself.

CAROLI LINNÆI
Med. & Botan. Profess. Upsal.

LACHESIS NATURALIS
quæ tradit

DIÆTAM NATURALEM

innixam Observationibus, et Experimentis desumtis eo ex Historiis, casibus, observationibus, populis itineribus, physiologia, therapia, physica, zoologica, ubi omnes demonstrationes innituntur observationibus

Philosophia Humana
Nosce te ipsum

The last lines are added by an elderly hand. As a motto on the title-page Linnæus placed the sub-heading *Philosophia humana* and the saying of the Delphic Oracle: know thyself. It brings to mind how this philosophy had emanated from an all-embracing conception of Man as the nuclear centre of the Universe. The psychological aspects of body and mind accordingly reflect almost indeterminable facets of medical thought. Post-Carthesian views can here be discerned against a rather vague background of an all-embracing dietetic.

The principal key to an understanding of Carl Linnæus' general ideas is his *Philosophia humana*. In his time medicine was still in many respects an old philosophy. Particularly was this the case with the teachings concerning a natural way of living, called *Dietetics*. This Philosophy of Medicine as a Philosophy of Man was deeply rooted in Old Greece and the centuries of the New Era before Linnæus had given it a stamp of ontological metaphysics.

It seems important that, in the last period of his life, Linnæus wished to formulate his views on medicine, in a tabulated style very characteristic of him, into a comprehensive survey of his systematic thinking in medical

matters. In this way *Clavis medicinæ duplex, exterior et interior* came about. It was printed in the year 1766, but it had been prepared a couple of years earlier. During the bicentenary in 1907 a copy of this very rare pamphlet was found in the collections of the Linnean Society of London. In this copy Linnæus had inserted explanatory notes and moreover added a list of medical aphorisms and sentences of his own. The new edition was issued in the same year by the distinguished Finnish physician Otto E. A. Hjelt, for the Royal Swedish Academy of Sciences.[1]

Clavis is not only an outcome of Linnæus' known tendencies to build systems, it is also a product of his speculative genius from the 1750s onwards. Although Linnæus never was a philosopher in any strict sense, he did not lack an inquisitive streak which united the youth in him with the aged man. Hence a good deal of attention should be paid to the structure of the general medical systems of this booklet.

In the following pages some of the most generally formulated sayings of Linnæus will be rendered from the Latin text of *Clavis*, published by Hjelt.

Apparently Linnæus commits the core of his reasoning in medical matters to these sentences, which were written by him in a lapidary and often difficult style. Although Linnæus' way of thinking sometimes seems to be beyond our reach, attempts should be made to understand it. These sentences, notwithstanding their peculiar style, can be regarded as elucidating Linnæus' views in general and especially on medical matters. Without grasping the framework, the fundamentals of his system would also be difficult to understand.

The sentences are collected from Linnæus' own notes in the interfoliated copy of *Clavis*. In several instances the editor also seems to have picked them out of Linnæus' other writings. A sequence of them is here reproduced in English translation. The sequence is made by the present author. Some slight corrections are made. Several other sentences from the manuscript are inserted in the text. In the footnotes Linnæus' original text is reproduced

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[1] *Caroli a Linné Clavis medicinæ duplex*, Holmiæ 1766, later editions Langensalza 1768, Naples 1793. Printed as Appendix (pp. 159–242) to Otto E. A. Hjelt, *Carl von Linnés betydelse som naturforskare och läkare*, Upsala 1907. A Swedish translation by Albert Boerman and Telemak Fredbärj, *Valda avhandlingar av Carl von Linné*, ed. by Svenska Linnésällskapet 52. Ekenäs 1967.

only when it deviates from the readings of Hjelt. Some parallell passages are observed and the abbreviations have been expanded.

1. The Soul (*anima*) is not life. It is the God within us.

2. The Virgin-like fire of Creation continues through the transmitter (*per Traducem*), and consequently does not proceed outside of the species.

3. The World is from God, the body is from the soul.[1]

4. Motion comes from Nature. No body can move on its own. The daughter of God, the soul, is the prime mover through the transmitter, as is the flame to the candle, (and) the prime motion in the Universe is by God's hand; everything is conserved through motion.[2]

5. Everything is conserved through motion, everything is destroyed through quiescence.

6. Life is conserved and persists through motion.

7. Life is an electric fire. The fire lives and moves. The Vestal flame is kindled by the transmitter.[3]

8. Nature and mind are never at rest. This is also the case with light.[4]

9. The mind is often forced by Nature. The struggle between body and soul.[5]

10. The will comes from the mind, ideas from Nature.[6]

11. The cerebrum concerns the mind, the cerebellum the motion, the medulla cerebrum the vital motions.[7]

12. The brain has a double function: to reason and to move.

13. Reason (comes) from the multitudinous memory of the senses.

14. Memory is contained in the back of the head, (it is) shown by examples: Reason consists of memory and sense-perceptions.

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[1] *1–3: Anima vita non, est Deus in nobis. Ignis vestalis creationis continuus per traducem, ergo non extra genus. Nullum corpus movetur a se ipso, universum a Deo, corpus ab anima. residet inter oblongatam et cerebellum ut inter radicem et caulem contrarieque. sedet ut Aranea in rete, manibus cerebellum, pedibus oblongatam ludit.* (*Natura et Mens*).

[2] *4: Motus a natura. Nullum corpus movetur a se ipso, Dei filia Anima movens per traducem ut lux a candela a primo motu universum manus Dei, omne conservatur motu.* (*Introductio*, p. 5 interlinear note). Cf. *Anima primum movens motor absque natura movet Naturam et Mentem.* (*Theoria*, p. opposite 11).

[3] *7: Vita ignis electricus, ignis vivet et movetur. Vestalis flamma per traducem accensa.* (*Theoria*, p. opposite 11).

[4] *8: Natura et Mens neutra nequitur quieta* [*sc. esse*] *ut lux.* (*Natura et Mens*).

[5] *9: Cogitur Mens sæpe a Natura. Lucta corporis et animæ.* (*Natura et Mens*).

[6] *10: Idææ a Natura, sic idea excitat penem, non voluntas.* (*Natura et Mens*).

[7] *11: Cerebrum mentis, cerebellum motus, cerebellum medullare motus vitæ cerebrum corticalis somni, oblongata circulationis, spinalis vigoris, caudelis veneris.* (*Natura et Mens*).

15. The body consists of a double principle as in the warp and weft of material.[1]

16. The central parts of the nervous system (*encephalum*) come from the mother, the body from the father. The inner and the outer man.

17. The inner man originates from the mother, not the father.

18. The foundations of life, the heart and lungs, diastole and systole, persist as long as life exists.

19. The lungs inhale the air, but the air does not enter into the blood.

20. The inhaled air is electric, but not so the exhaled air. In consequence it is collected in the lungs and is deprived of its electricity. It dies in a moment without leaving any symptoms.

21. There are no channels for the electricity, it follows the whole (body).

22. The flame of the candle cannot glow without air, neither can the flame of life.

23. The concord of the world originates in discord.[2]

24. Medicine is the opposite of disease.

25. The species are divided into opposites. The most wholesome bread, when taken in excess becomes harmful.

26. The principle of contrast is split up into five.

27. (Medicine) was formerly called an art of guessing, and (still) is.

28. (Medicine) should be of mathematical certainty.

29. The Schools of Galen, Astrology, Signatures, Hermetism, Stahl are today faded doctrines.[3]

30. The principles of the mechanical school, founded upon the functions of the heart, and in ignorance of the brain, are false.

31. Whoever should deliver the key ought to be familiar with the qualities of Nature, physiology, pathology, natural dietetics and matter.

32. The complete theory concerning the working forces has been left for me to solve. I shall provide the key.

The Linnean aphorisms belong to the history of medicine, and it is the task of the historians of medicine to decide what Linnæus owes to his forerunners and what may be original. How much he actually owed to the Old Medicine becomes apparent from his statement that medical science

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[1] *15: Corpus consistit duplici principio* renning *et* inslag. (*Pathologia*, opposite p. 7).

[2] *Mundi concordia ex discordibus, constat Seneca.* A paraphrase of *Universum lucta discordium aequilibratur*, added on the title page.

[3] According to Hjelt p. 160: *Dogmatica Galenica, Astrologica, Signata, Hermetica, Mechanica, Stahliana, Dogmatica hodierna palliativa.* The reading of the last word may be uncertain. I propose relating it to Latin *palleo* (*pallidus*).

was only an "art of guessing, totally lacking the exactness of mathematics".[1] What a striking contrast to the bold language in the Preface of *Diæta 1733*! It would, however, be a delicate task to extract a completely explicit meaning out of these Linnean sayings, because they lack running context and are partly scattered in various places in his writings. Much is only aphoristically and fragmentarily expressed. Sometimes the sentences are ample in content and comment; with luck they are also products of thinking and brilliant wit.

Linnæus became acquainted with the great literary tradition of the Hippocratic medicine during his last year at school. Already as a student he was very widely read in medical and kindred matters, all the more so as he had access to the foremost private libraries in Lund and Upsala. A principal characteristic in the dietetics of olden times was that between the health-factors κατὰ and παρὰ φύσιν there was a basic concept created by Galen at the end of the second century, which made a distinction between the necessities and non-necessities in hygienics. Its six conditions of health were the surrounding air, moving and resting, sleeping and waking, retention and evacuation and mental excitements (*animi pathemata*). In the Middle Ages these facts were restated in the terms *res naturales* and *non naturales*.[2] Linnæus still makes use of these old distinctions, although he uses a considerably wider scale.

Linnæus' main interest was the study of the generation forms of living nature. The knowledge of these organic processes was, during Linnean times, still obscured by the bewildering views of earlier centuries. From pre-Hippocratic ages the analogies between animal and plant and between egg and germ had been primary findings of biology. But in principle bio-physiology had never reached very much further than the saying of Empedocles that "the great olive trees laid eggs".[3] The famous dictum of Harvey *omne animal ex ovo*, forecast by Fabricius of Aquapendente in the sixteenth

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[1] Aphorisms 27 and 28 above, compared with *DN* p. 18: *Mathematica evidentia, systema totum involvit, quid jam in medicina quod non principiis mechanicis demonstratur, adeo clara sunt ut nil evidentius.* Probably this part of the preface is to be dated to the years in Holland or somewhat later. See the author's note in *SLSÅ* 1967 pp. 93 sq.

[2] Fredrik Berg, *Hygienens omfattning i äldre tider, Lychnos* 1962, see especially pages 94 sq. and 104 sq.

[3] Joseph Schumacher, *Antike Medizin*, Berlin 1963, pp. 186 sqq.

century and by Malpighi at the beginning of the seventeenth century not only became a doctrine but a symbol for Linnæus. The mediatory position of Harvey concerning the generative functions was apparently that of Linnæus. The theory of reproduction advanced in 1759 by Caspar Friedrich Wolf evidently passed him by. We find the Harveyan egg alluded to already in the preface of *Diæta*, and also depicted on the seal of Linnæus. Finally, after he had been knighted, he reproduced the egg in his coat of arms. This may be mentioned here only to illustrate Linnæus' fondness for symbols.

Linnæus' systematization was founded on identities and analogies in the "three realms of Nature". The *a priori* of the system lies in the type-concept, which was worked out to include *species* and *genera*. The constancy of the organic types was the constancy of Nature herself, and reproduction through generation was the primordial fact of the systematization. When towards the end of his life, Linnæus built up medicine into the grandiose system of *Clavis*, the core of it was no other than his early conception of the Sexual system, enlarged into a rather visionary cataclysm.

It cannot be the purpose of these chapters to give a full-length portrait of Carl Linnæus. But as a prominent historian of medicine, Walter Pagel, has recently pointed out, it is necessary to make a portrait of a man of science not only with a view of understanding those of his theories which are still current, but in order to grasp the whole of his personality within the framework of his own epoch.

I. Learning and Magic

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Carl Linnæus began his study of the natural sciences during his school years at the Växjö Grammar School. By this time we find him engaged in excursions in the country; he read medicine and botany, a common combination of subjects in those days, subjects, which were eventually also to form his vocation as a scientist. During the last years at school he acquired the rudiments of medicine by reading Herman Boerhaave's *Institutiones* under the guidance of Johan Rothman, M.D., a County Medical Officer in Växjö. Rothman was a pupil of Boerhaave, about whom it has been said that he "must be regarded as the greatest physician of modern times".[1] Later during his sojourn in Holland, Linnæus himself became a disciple of Boerhaave who remained his never-forgotten teacher and friend.

The first results of Linnæus' apprenticeship in the sciences came to the fore in his preoccupation with healing and aromatic herbs. His insights into the subject are laid down in a literary document which Linnæus started to write at the age of eighteen and continued up to his student days (1725–1727). These notes have, in our time, been published under the title *Carolus N. Linnæus' Örtabok* ('Book of Herbs'), edited in 1957 by Telemak Fredbärj, M.D. This little notebook is remarkable as being the first, still immature fruits of Linnæus' botanical and medical reading. It betrays its origins in the tradition from Dioscorides and Galen, and reflects the neo-Hippocratic medicine received by Linnæus in Boerhaave's school. The Paracelsic medicine, distinctive of the sixteenth and the first half of the seventeenth century, had had its day. Robert Boyle and Herman Boerhaave had already relegated spagyric iatro-chemistry to the history of learning, but its traces had not entirely vanished. Notwithstanding newer advances the old Hippocratic and Galenic tradition still retained a place in the general concepts of Linnæus' days.

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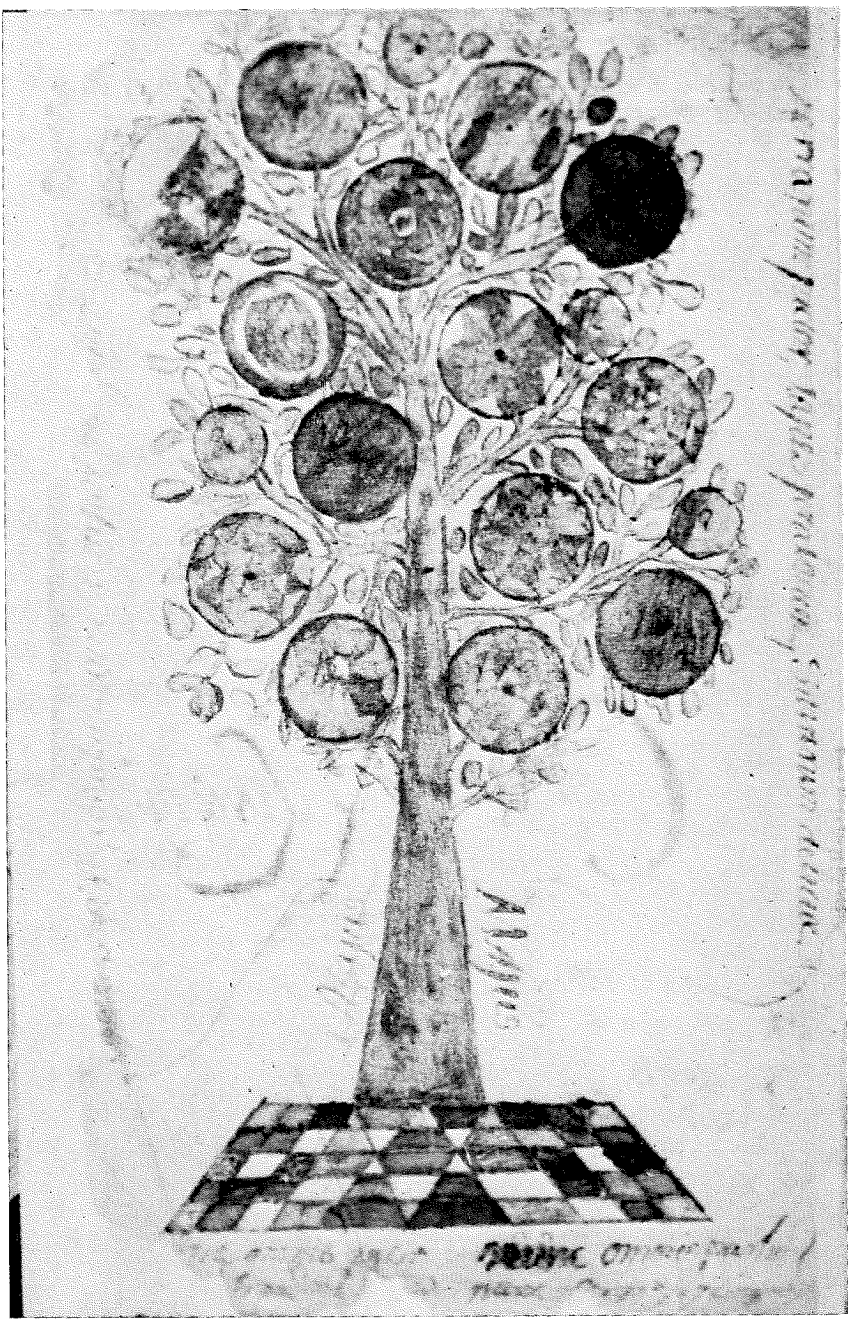
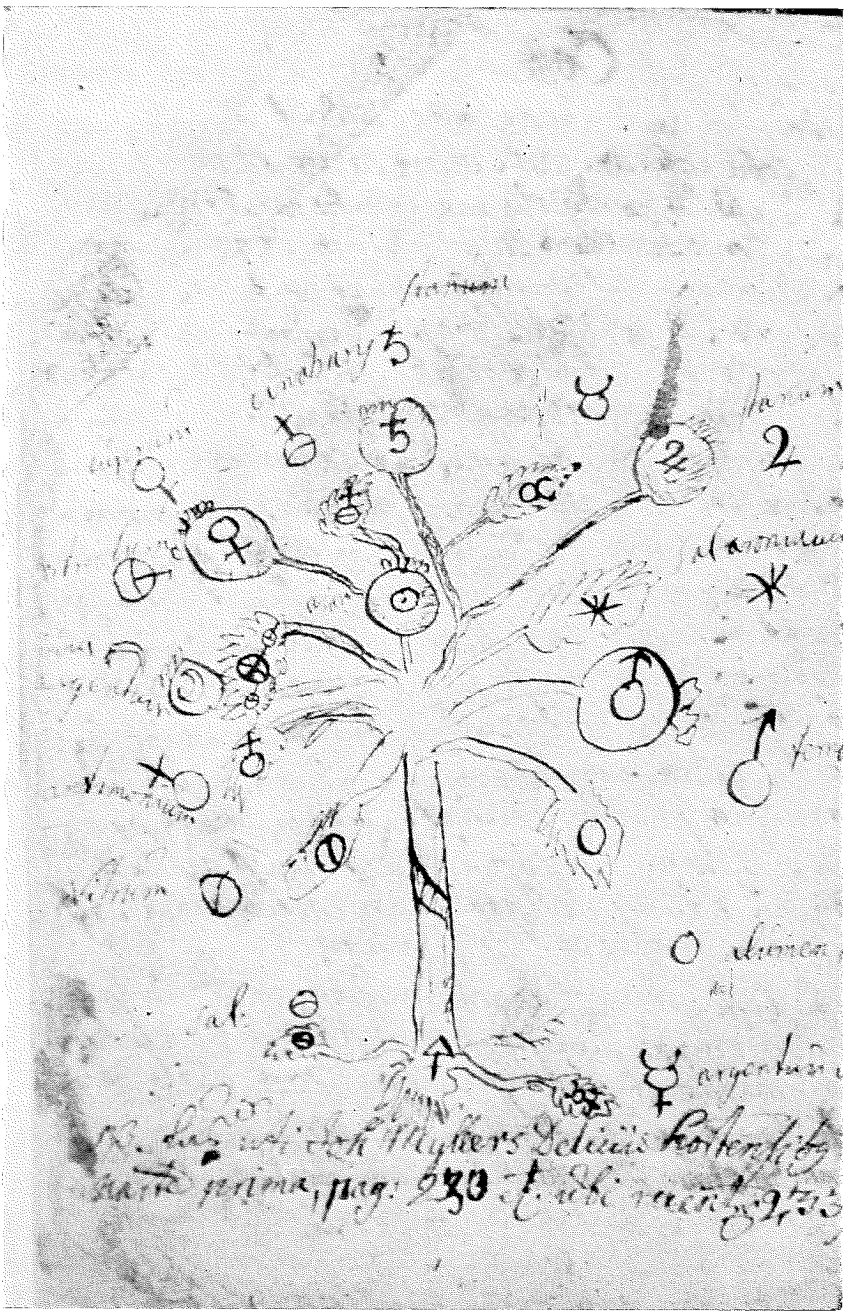
[1] Charles Singer (and E. A. Underwood), *A Short History of Medicine*, Oxford 1962, p. 149.

PLATE I



Arbor Majalis (Linnæus' Örtabok).



Arbor alchymiæ (Linnæus' Örtabok).

In the next few years the young Linnæus' study of Nature turned to what he calls a more autoptical line. When in 1729 and 1730 the earliest seeds of his famous Sexual System for plants were laid down, their title was: *Præludia sponsaliorum plantarum* ('Preludes to the Wedding of Plants'). Its sub-title lays stress upon his intention to treat the physiology of plants, to show their sexes, and their modes of generation, as well as to reveal the striking analogy between plants and animals.[1] Linnæus was not unaware of the importance of this discovery and inserted it into his *Systema Naturæ* (first edition 1735). For Linnæus the sexual dichotomy in Nature becomes a primary matter of fact.

In his twenties Linnæus was very widely read in the science of nature of older times. His reading is shown in his *Örtabok* as well as in the library of his youth which contained hermetic occultism. In the catalogue of his library,[2] begun as early as 1729, we come across works which he grouped together under the heading *hyperphysiologi;* and names such as Agrippa, Lemnius and Mylius, in addition to Digby, Sendivogius and J. J. Becher appear there. Agrippa of Nettesheim's *Opera omnia* were among Linnæus' earliest acquisitions. Later on both Agrippa and Albertus Magnus are quoted in the *Lachesis* manuscripts.

As frontispieces of the Linnean 'Book of Herbs' from 1725–1727 we find two trees, one in flower and one in leaf. The first of them may be called a maytree. On this page Linnæus writes: *Majus, terrarum pictor, tapes pratorum, silvarum deliciæ*, words which were highly significant for him. On the other side of the picture stands a bucolic citation from Vergil: *Nunc omnis ager, nunc omnes parturit arbos*. This is the Linnæus who is known to everyone as "the king of flowers". But his youthful 'Book of Herbs' has also two other drawings of trees, obviously depicted from a hermetical *arbor alchymiae*.[3] The root, stem, leaves, and fruits have the alchemical signs of Sun, Moon,

[1] *Præludia Sponsaliorum Plantarum in quibus Physiologia earum explicatur, Sexus demonstratur, Modus generationis detegitur, nec non summa plantarum cum animalibus analogia concluditur*. Ed. by Th. M. Fries in *Skrifter af Carl von Linné*, IV, Uppsala 1908 (Swedish Academy of Sciences). In *Philosophia botanica*, 1751, Linnæus looks at the physiology of plants as *vegetationis leges* and *sexus mysterium*, gives a list of his forerunners. See p. 11; pp. 88 sq.

[2] *Caroli Nic. fil. Linnæi Bibliotheca medica*, ed. by T. Fredbärj, Ekenäs 1956.

[3] Concerning *Arbor Hermeticus* see Kurt Seligman, *The History of Magic*, New York 1948, pp. 124 and 152.

Planets, and their elements. The tripartite root is marked with the symbols of the Paracelsian triad, sulphur, mercury and salt, and on the other page we read: *Omnia metalla proveniunt ex* ♃, ☿, ⊖. The figures probably come from Johann Georg Müller's *Deliciæ hortenses*, Stuttgart 1684, a book that Linnæus possessed and quoted. However one interprets these immature *Lesefrüchte*, it can hardly be denied that the young Linnæus was conversant with alchemical and hermetic speculations. Reminiscences of the older literature recur much later in the *Lachesis* manuscripts where we come across names such as Croll and Van Helmont, also Paracelsus, Cardanus and Ficino.

Carl Linnæus' great adventure in the three realms of Nature was initiated with his audacious and ardnous journey to Lappland in 1732. In the month of May, when, as he says, "the land was everywhere beginning to rejoice and smile", Linnæus commenced his journey, at the age of twenty-five. In Lund and Upsala he had made an extensive study of the natural sciences, specializing mainly in botany. The journey to Lappland was chiefly inspired by the botanical work of Olof Rudbeck the Younger and his expedition to Torne-Lappmark in 1695.

Linnæus' journey extended over nearly five months and was also made to include Western and Eastern Bothnia. Aims concerned with public utility were associated with observations and experiences which in the future were to benefit his scientific work in a variety of ways. For Linnæus the study of man in his natural environment was not the least important of his aims on the journey. The Lapps lived in an undisturbed natural environment, and their healthy life and uncorrupted customs, most particularly among the Mountain Lapps, fascinated the young traveller as much as the marvels of Lappland scenery.

The Itinerary contains therefore numerous observations concerning the conditions of life and culture, the occupations and manners, dwellings, dress, food and medicine of the Lapps. A central point is the anthropological interest in the physical and mental peculiarities of the inhabitants of the country, their adaptability to the barren conditions of nature, their healthy needs and simple habits, their secure existence, their feeling of equality and hospitality, their shamanistic beliefs, medical cures and

superstitions. Not only the native Lapps but also the Swedish and Finnish populations of the Northern regions under Swedish rule became the objects of such ethnographical studies in the field. Across the Norwegian border these studies were, by a deviation from the route, extended to the Atlantic coast.

Linnæus' tour of Lappland earned him much praise from his Swedish contemporaries. But apart from what he included in his *Flora Lapponica* (1737), the literary outcome of the tour remained in the collection of the Linnean Society in London together with the rest of his unedited scientific writings. More than one hundred and fifty years were to pass before *Iter Lapponicum*[1] was printed in 1889, and a good two centuries until it became possible to collate the results with *Diæta naturalis 1733* and the outcome of Linnæus' subsequent activities up to his appointment as Professor of Medicine at Upsala in 1741. During the past fifty years the ethnographical results have attracted considerable attention. But only recently has it become possible to assess the connection of Linnæus' early writings with his outlook during his early years. This makes a reappraisal of his scientific work necessary. The analysis of the Lapp material however is outside the scope of the present study. Lapp folk-medicine, of which Linnæus himself gave a short survey, has recently been discussed by Professor Åke Hultkrantz from the point of view of comparative religion.[2]

During his time as professor Linnæus travelled to Öland, Gotland and Småland in 1741, to Västergötland and Bohuslän in 1746, and to Skåne in 1749. On the whole these Swedish travels follow the same programme, but with a growing emphasis on their practical usefulness. They are recorded in travel diaries which Linnæus himself edited and published. In the diaries, however, we only get glimpses of the writer's own person and of his private thoughts. Only when he visited his home districts in 1741, do we find a number of recollections and annotations, which, partly at least, may be

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[1] The standard edition by Th. M. Fries, here cited, appeared in 1913 (Swedish Academy of Sciences).

[2] *Iter Lapponicum*, Appendix XI; Åke Hultkrantz, *The Healing Methods of the Lapps. Papers on Folk-Medicine 1961*, ed. by Carl-Herman Tillhagen, reprinted from *Arv* vols. 18–19, Uppsala 1964.

traced back to his early years.[1] Recollections and experiences from Linnæus' home districts in Småland make themselves felt at the back of the profusion of fresh observations in the Lappland diary, and are also frequently to be found in his *Diæta naturalis*. During the year following the Lappland journey Linnæus made use of his impressions for his private tuition on the natural way of living. From 1733 onwards he worked on the *Diæta* which, however, was left unfinished.

Linnæus' Dietetic belongs to a form of literature concerned with health and longevity that has its roots in Antiquity. It attempts to unite the physiological and philosophical views of the human bodily and spiritual well-being and longevity. Hippocrates, "the father of the art of medicine", was its scientific originator in one of the few works by him which can be considered genuine, the treatise on the influence of environment on human life.[2] The Greek word δίαιτα has a manifold implication; it denotes life, means of sustenance, means of earning a living, way of life. The Linnean Dietetic is a kind of medicine which aims at the natural way of living and is based on what he considers as the psycho-somatic nature of man. In Linnæus' notes from the 1730s we discover the essence of his concept of Life and Nature. Nowhere else is Linnæus' empirical method of collecting evidence in order to establish a system of nature more clearly expressed than here. We also come across Linnæus' notion of that ruling and obstructing destiny to which he gave the ancient names *Lachesis* and *Nemesis*.

The predominant feature in Linnæus' works was his interest in Man in his natural environment, and this interest included not only health and life, disease and death, but also all the material and spiritual qualities of man, food, clothing, household goods and houses, implements and occupations, amusements and customs, medicines and remedies, beliefs and superstitions. Here, as always, we meet with the Lappland traveller Linnæus, but also the wide-awake observer of country life and customs among the Swedish people.

"Medicine", he writes in the preface to *Diæta naturalis*, "has progressed

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[1] K. Rob. V. Wikman, *Carl von Linnés samling av småländska vidskepelser 1747*, *SLSÅ* XLVII, 1964, pp. 16 sqq.

[2] Max Pohlenz, *Hippokrates*, Berlin 1938; Fredrik Berg, *Hygienens omfattning i äldre tider*, *Lychnos* 1962, pp. 91 sq.

so far that it must not be treated as a science in the making". He himself stuck to what he discovered empirically. "The discoveries of Hippocrates and all observers are permanent and still apply today", he states. In this connection he also refers to Harvey, "who kindled a great light among the Circulation and the Egg" and "who is said to be among the immortals".[1] All goes to show that Linnæus in the 1730s can be described as one of the young men of the coming age of Enlightenment in Sweden. The names of Ludvig Holberg and Olof Dalin in the *Diæta* foreshadow the start of a new trend in the thinking of eighteenth-century Scandinavia. The names of Bacon and Locke represent the empirical way of thought of the new times. About Bacon of Verulam Linnæus in another place stated that "Bacon saw what was failing in the sciences", and Galileo he counts among "the immortals".[2]

The importance of Linnæus' stay abroad 1735–1738 can hardly be overestimated. The intellectual climate of the free Netherlands brought Linnæus' thoughts on Nature to maturity; his scientific empiricism was confirmed and to his outlook on life new horizons opened. After his return to Sweden he made the following note: "Wherever there is freedom of thinking and writing, studies flourish. Wherever there is free religion, the country flourishes; where the clergy (theology) holds sway, there is nothing of this, there things are in bad way".[3] Very little of his youthful philosophy of Nature is to be found in the *Diæta* notes, and his alchemical fancies vanished completely in the Boerhaavian atmosphere. No more than Boerhaave did Linnæus become blind to the physics in medicine. He was able to pick up this element already during his school-days from Friedrich Hoffmann's *Fundamenta medicinæ* (1703).[4] The theoretical position of Boerhaave was assessed long ago by Ch. Daremberg in his *Histoire des sciences médicales* (1870) as "l'echo d'une iatroméchanisme, melé d'hippocratisme et de chémiatrie",[5] and Linnæus never disregarded the scholarship of his great teacher. The rationalism of the period directed Linnæus into the field of systematization

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[1] *DN*, pp. 18 sq. and *LN*-MSS.

[2] *LN*-MSS.

[3] *DN*, p. 199.

[4] The book was acquired by Linnæus in Jan. 1727 according to his *Bibliotheca medica*.

[5] *Hermanni Boerhaave Prælectiones de morbis nervorum* 1730–1735, door B. P. M. Schulte (*Analecta Boerhaaviana* II), Leiden 1959, p. 2.

of Nature. Dioscorides the Second was the name of honour given to him when in 1736 he became a member of the *Academia Imperialis Leopoldina Carolina Naturae Curiosorum* and thus assumed the principate of Botany which in the future was to be his special distinction.[1] In the vast medical school of Boerhaavians he became an organicist and not a mechanist. His great asset during these years was, however, an insight into the subject applied in his Dietetic.

With Linnæus we thus arrive at the Century of Anthropology, where many paths meet in the far-flung field of comparative science. The ideal of his Dietetic was an animally conceived existence. The habits and rules of such an existence were the pillars of his teaching on the sound and proper art of living applied to human and social life. To the great naturalist nothing natural is alien. He searched for what was necessary in events which he called the *Lachesis*, and he never shrunk from the physician's frank expressions of it. He often preserved his old-fashioned ways of expressing it in the terms of the Old Testament. Moreover he adorned it with the wisdom of the authorities of Roman Antiquity, principally Pliny and the Stoics. But still more often he used the language of the art of medicine of his own time.

Through his experience of the life of the Mountain Lapps Linnæus was confirmed in his opinion about the Noble Savage. But he went further back to the earlier sources of this idea, above all, to the Hugenot Missionary, Jean de Léry, in the sixteenth century, whose famous literary work *Histoire d'un voyage fait en la terre du Brézil, autrement dite Amérique*, was published in Latin in 1586. Among other authors we find the Netherlander van Lindschotten concerning India (1599), the Englishman Thomas Harriot about the Virginians (1590), the Swede Campanus Holm about the Indians in New Sweden (1702), and the Frenchman Jean Baptiste Labat on West Africa (1728). But above all we come across Linnæus' own Lapps. Linnæus was, in fact, an early representative of the anthropology of the eighteenth

[1] In 1736 Linnæus had the epithet *Dioscorides Secundus* with the emblem of the Society (a World-circle and two snakes) engraved on his signet. (Th. M. Fries, *Linné*, I, Stockholm 1903, pp. 244 sq.) He still used the epithet on the copper-plate portrait (1748) in *Philosophia botanica*. For the emblem see Werner Leibbrand, *Heilkunde*, München 1954, plate 16.

century. By this time there was a general tendency to emphasize the importance of studying primitive habits and customs, thus anticipating the social anthropology of later times.

Diæta naturalis remained a torso in Linnæus' large output; not even its continuation in the form of lectures on dietetics, *Lachesis naturalis*, brought the vast subject to a literary completion. Posterity may, for good reasons, regret that the early work never became generally known amongst Linnæus' contemporaries. For despite its fragmentary character *Diæta naturalis 1733* contained a wealth of material which tied up with contemporary ideas; it was new, and anticipated the future. With keen feeling for the intellectual atmosphere of the time, such men as Rousseau, Voltaire and Goethe could appreciate the genius of Linnæus, although they were some distance away both in space and time.

The *Diæta* shows but few traces of Linnæus' youthful excursions in occult literature. The astrological and alchemical elements have been excluded, and the outlook is essentially empirical. But when Linnæus moves on the borderlands of empirical knowledge, he still shows himself dependent upon old traditional modes of thought. On the whole his anthropological attitude is post-Cartesian, especially as far as the psycho-somatic relationships are concerned. An important argument for abiding by the ancient sympathy doctrine was obviously for Boerhaave, perhaps also for Linnæus, the presupposed *sensus communis* as a psycho-somatic substratum for co-ordinating the inner and outer world of man.[1] It is of a certain interest to see that in Linnæus' view on emotional behaviour there is a trend in the Cartesian direction. This is quite noticeable when it comes to emotions such as anxiety, anger, joy, and fear. Linnæus is an assiduous and keen observer of sexual behaviour amongst men and animals. The sensations are dealt with in detail by Linnæus, who regards them as necessary conditions of thought. He declares that neither a child nor a sleeping person can think without sensations. But all that is thought has to pass through *argumenta et similitudines*. If man had more senses he would understand more, Linnæus writes, but adds: "of what nature such senses would be, I cannot tell".

Linnæus' psychology of the senses seems to have some affinity to the

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[1] B. P. M. Schulte, op. cit., pp. 264 sqq. and 389 sqq.

Lockean views and we cannot altogether exclude influences from this quarter.[1] With regard to Linnæus it is, however, difficult to discern more precisely his various philosophic references behind the lapidary style of his notes. Their general aims are fortunately more transparent. He turns away from a purely mechanistic attitude. In the *Clavis* notes we have perhaps some faint reminiscences from Boerhaave, if not, more directly, from the post-Cartesian philosophers, for instance: "I am conscious through continuous thought" (*mens meditando continuo conscio*).[2] *Id quod cogitat mens dicitur*, is a genuine Boerhaavian phrase of Cartesian origin. For Linnæus as for his old teacher "the *conditio humana* is ultimately dependent on the causality of God".[3]

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[1] Linnæus had, perhaps, during his first year as a student in Lund, already gleaned such topics from Andreas Rydelius. In this connection the name of Andreas Rüdiger should also be mentioned. See Sven Wermlund, *Sensus internus och Sensus intimus*, Uppsala 1944, pp. 149 sq., 280.

[2] *Clavis* MS under *Natura et Mens*.

[3] B. P. M. Schulte, op. cit., p. 384. Concerning Boerhaave the commentator, p. 410, remarks: "Even though his concepts of the human mind are based on Descartes, his conception of the causal connection between spirit and body, amongst other things, is more advanced. His final concepts on this subject may be traced in Malebranche's Occasionalism".

Frontispiece to *Fauna Svecica* 1746, engraved by Jean Eric Rhen.

Linnæus' name has gone to posterity as that of the great 18th century systematizer of Nature, above all of the vegetable kingdom. The famous Sexual System of Linnæus was a fundamental achievement of his systematizing genius. During his lifetime Linnæus made efforts to bring order into the increasing and widening mass of natural facts and finds in all the three realms of Nature. The many editions of *Systema naturæ* (five original editions from 1735 to 1766–67) show evidence of this.

In 1746 Linnæus issued *Fauna Svecica*, the frontispiece of which is reproduced in these essays. It is a picture of Mother Nature in the image of an Ephesian Diana in a Baroque style with, as it seems, a World-egg in her right hand and an Ouroborus in her left hand. The realms of Nature are painted on her skirt. As in the classical myth the hart accompanies Diana.[1] In this connection it may be noticed that Linnæus was a naturalist of the unarmed eye. Accordingly his 'System of Nature' became a product of an eidetic holism, symbolically expressed in the copper-engraving. The original vision of Linnæus' system was the world of plants which he looked upon as in a grandiose pictorial work like those of his forerunners in the Botany of the 16th and 17th centuries from Cesalpino in Italy to the younger Rudbeck in Sweden. Without such a common historical and æstetic viewpoint the system visions of Linnæus are hardly to be understood.

Basic for the theory of the Linnean system is *Fundamenta botanica* (1736), definitively elaborated in *Philosophia botanica* (principal edition 1751). Praise

[1] For an explanation in details see Otto Giertz, *Artemis och hinden*, *SLSÅ* 1946, pp. 13 sqq. Dr. Sixten Ringbom kindly drew my attention to Mother Nature depicted as an Ephesian Diana in Joannes Sambucus, *Emblemata et aliquot nummi antiqui operis*, second ed., Antwerpen 1566, p. 65. (According to Arthur Henkel & Albrecht Schöne (eds.), *Emblemata, Handbuch zur Sinnbildkunst des XVI. und XVII. Jahrhunderts*, Stuttgart 1967, col. 1534). Isis with mural crown, veil and necklace depicted in Vicenzo Cartari, *Imagini delli dei degl'antichi*, Venice 1647, p. 298 (reprinted, Graz 1963).

and blame have been spent upon this work up to our own day. The principles of the Linnean taxology put down in this 'philosophy' have been passed on to the biological sciences. It cannot be our task to discuss the epistemological gap between morphologists and physiologists. Most of the renown and criticism can be thrown back into the melting-pot of 19th century biology. The vital point of Linnæus' own reasoning comes into view already in the draft of *Systema naturæ*, published in 1735, where Linnæus declared: "The knowledge of nature consists of a true idea concerning object-matters. The objects are distinguished from one another and recognized through a methodical division and convenient denomination." The key-word in the reasoning is *Method.*

It cannot be denied that as a naturalist Linnæus started from direct observation and thus proceeded on empirical lines. The deciding fact was sexual fertilization as the basis for organic reproduction in general.[1] *Sexus initio rerum.*[2] The purpose of the methodological procedure was accordingly to establish organic coherences and consequently to establish the continuity in living nature.[3] The method resulted in formal discerning (*dispositio*) and verbal denominating (*denominatio*) in the spirit of the systematic thinking of the age. Its scope was neither scholastic nor mathematical but founded on a 'Logic of facts', which did not lack qualitative aspects and ultimately aimed at universal perspectives. Without the binary denomination the generic name would be a "bell without a clapper", Linnæus said. As is well known the binary nomenclature still persists in the biological sciences.

The method implies an intuitive, and consequently more or less subjective, analysis developed as a comparative procedure. It is characteristic that Linnæus' observations also in medical matters often refer to his own experiences. The comparative procedure was inherent in the method. However, the mixture of empirical and rational arguments is obvious. The verification could never become exact. This is especially seen in the biased conceptualizations of general facts and reasonings. In the last words of *Philosophia botanica* Linnæus declares that the principle of truth must always be verified in the

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[1] *Fructificationis partes sæpius constantissimas differentias subministrant. Sunt in fructificatione plures partes, quam in tota reliqua planta. Philosophia botanica*, p. 222.

[2] Op. cit., p. 86.

[3] *Scientia Botanices his cardinibus nititur.* Op. cit., p. 97.

Science of Nature.[1] Linnæus' systems were built up as armies of *species*, *genera*, *classes* and *ordines*. Practically sean *Philosophia botanica* is a code for coordinating the botanical species and names in accordance with the first principle that "order is the spirit of the sciences".

The following verse is often cited as a Linnean saying:

Nomina si nescis, perit et cognitio rerum.

Actually, however, this is only a paraphrase of a passage from the 'Etymologies' by Isidore of Seville.[2] The tune seems platonizing. *Systema naturæ* is not a pure encyclopædic outcome of the age thoughly. Accordingly the nominalistic approach of Buffon could consequently not affect Linnæus very much. As little as the system of nature, the system of disease was a product of pure abstraction.

The medical annex to the systems attracts special interest. The systematical views on the diseases were presented as lectures at the university seven times over a long sequence of years from 1741 to 1770. Linnæus' views were unfolded in several instalments during a long co-operation with the French physician and botanist François Boissier de la Croix de Sauvages (1706–1767) in Montpellier. The school of Montpellier is known through its platonizing tendencies. The nosological system of Sauvages was published in 1763. An abridgement of the closely related Linnean system entitled *Genera morborum* was delivered in the same year. The lecture manuscripts were edited and annotated by Professor Fredrik Berg of Upsala in 1957. The classification and terminology of the diseases was the main purpose of Linnæus, who avoided all questions concerning causes and conditions.[3] A glance at the starting-points of the systems seems to indicate a basic contrast between promoting health and curing illness. The contrast is to be found already in *Corpus Hippocraticum* and had been further developed in the Scholastic conceptions of favouring nature by natural means and treating the evil opposite with contraries. This point of view was cardinal in the Dietetics of Linnæus.

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[1] *In scientia Naturali principia veritatis observationibus confirmari debent.* Op. cit., p. 287.

[2] Op. cit., p. 158. Lector Sven Blomgren, Åbo, has kindly pointed out the passage in *Etymologiae* l. I, ch. 1.

[3] *Linnés Systema Morborum*, ed. by Fredrik Berg, Uppsala 1957, pp. 62 sq.

The main concepts of the Linnean medicine, such as the insensible perspiration, the secretory and generative functions and substances and their connections with the diseases, form an empirical foundation of his Philosophy of medicine. Pre-scientific concepts, above all the principle of *similia similibus*, were, however, still leading motives for him. In a marginal note in the *Lachesis* manuscript he expressly says: "similars act on similars" and adds: "although recent authors wrongly dispute this; it is, however, certain."[1] It is rather surprising to find that Linnæus still maintained the theory "like cures like" and conversely "unlike against unlike". In *Corpus Hippocraticum* the sympathy-cures seem rather obsolete.[2] But the sympathy-doctrine of the Stoics had obviously played a considerable part in the learned propagation of such ideas through the ages.

Linnæus' opinion about the healing powers of the herbs shows that the conceptions about the effects of contraries were still living in the therapeutics of his time. As a matter of fact this doctrine about contraries (ἐναντίωσις) dates back to Pythagoras. Galen and the Scholastic doctors in the Middle Ages had developed it into a dialectic system with the purpose to restore or improve the deranged equilibrium by furnishing the body with contrary-working remedies.[3] In the thesis *De viribus plantarum* (1747) it is said that the balance between the firm and floating elements of the body should be restored through the contrasting remedies. *Hinc morbi contrariis morbis sæpius curantur.*[4] The doctrine is more dialectic than medical. Already Van Helmont in the first half of the 17th century discredited such views[5]. When introduced as a part of the herbal system of Linnæus the theory of contraries acquired some resemblance to the doctrine of the Signatures, all the more since the obscure healing virtues or powers of the plants are ultimately regarded as coming from God Himself. In *Clavis medicinæ duplex* the theory of the

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[1] *LN*-MSS, fol. 18: *Similia agunt in similia, negant recentiores, non recte, certe.* In *DN*, p. 158, Linnæus refers to the *axioma æternum chymistarum* of *similia* and *contraria* as rules for the digestion.

[2] Joseph Schumacher, *Antike Medizin*, Berlin 1963, p. 209.

[3] About the therapeutical doctrine of contraries in Antiquity and MA see Joseph Schumacher, op. cit. p. 47 et passim; Werner Leibbrand, *Heilkunde*, pp. 20, 76, 109 sq.

[4] Op. cit., pp. 3 sqq. Cf. Otto E. A. Hjelt, op. cit., pp. 104 sqq.

[5] W. Pagel, *J. B. van Helmont, Osiris* VIII, 1948, p. 404.

contraries is stretched to its utmost point. At the same time Linnæus commented on the subject in a thesis where it is said that five abnormal states of the body usher in as many correspondent diseases and their contraries for which nature indicates as many remedies and their contraries.[1] Linnæus' unfortunate dependence upon the traditions of ancient medicine is nowhere more clearly manifested than here.

Philosophia botanica is closely connected with *Clavis medicinæ duplex*, the proper subject of which is a Pharmacy of plants. The dynamic aspect of *Clavis* lurks in the Linnean conceptions about the healing powers (*vires*) of the plants, which he develops into an entire system of medicine. Primarily the concept in Linnæus' writings is to be found in the latter part of *Diæta 1733*, where he says that "the virtues of herbs are from God".[2] Linnæus' 'Book of Herbs' overflows with quotations from old authors on plant-medicine such as Pliny, Dioscorides, Macer, Theophrastus, Prévost, Ray, and others.[3] As authorities for the views in *Philosophia botanica* are quoted J. Hermann, R. J. Camerarius, Friedrich Hoffmann and his own thesis *de viribus plantarum* 1747.[4] It is remarkable though that the doctrines of astrologers, alchemists and signature-teachers are rejected here as well as in *Clavis*.[5]

Whenever such occult elements were primarily eliminated, the obscure concept of *vires*, a target for the sarcasms of Molière, still persisted. On the basis of this principle, with the key-stones of old ideas concerning the five elements, Linnæus constructed, to put it briefly, a pentacle of dualities which he thought could be brought to mobile equilibrium. The fundamentals of this medical system were then incorporated in the last editions of his *Systema naturæ*, thus warranting its importance as a universal view of nature.[6] Un-

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[1] *Dissertatio medica de effectu et cura diæteticorum generali*, Upsala 1766; see Otto E. A. Hjelt, op. cit., p. 75 and note 1.

[2] *DN*, p. 186.

[3] *Carolus N. Linnæus Örtabok* 1725, passim.

[4] *Philosophia botanica*, p. 278.

[5] *Astrologi virtutem ex astris influxum in plantas, signatores vires a similitudine inter plantas partem et corporis partem læsam divinarunt. Chemici vires vegetabilium ope analyseos ignis extricare crediderunt.* (As examples he names Geoffroy Tournefort and Tawry). Op. cit., p. 16, cf. *Clavis*, aphorism 29. Introduction above.

[6] *Systema naturæ*, 12th ed. p. 16. Cf. Erik Nordenskiöld, *En blick på Linnés allmänna naturuppfattning och dess källor*, *SLSÅ* VI, 1923 pp. 21 sqq.

fortunately Linnæus did not notice that the old magic of the sympathies and signatures sneaked into his system.

The doctrine of Signatures, having obtained its shape through Agrippa, Paracelsus, Porta and others, is well illustrated by Oswald Croll's *Tractatus de signaturis* (1608), where is said: *Ita etiam Deus cuique Plantæ indidit proditorem suum, ut genuinæ vires Herbarum latenter absconditæ per Signaturas externas, id est similitudinem Formæ atque Figuræ ex illarum aspectu cognosci, divinari ac manifestari possint; imo ut modo dictum, illæ magice nobiscum per Signaturas loquuntur.*[2] Although Linnæus never was an adherent of the Signature-school, smells and odours of grass or plants were somehow combined by him according to their qualities and effects. It is an experience, very often stated by him, that animals instinctively avoid eating certain plants.[3] Even if already in *Diæta* he had declared the virtues of plants as originating from God himself, the qualities of opium or quinine were just as obscure as those of mercury and magnets.[4] In such a way their effects were magically warranted. Seen thus the views of Linnæus become a faint adumbration of a rationalized magic. Much of that is a combined product of new science and old learning. The core is hidden in the obscure and floating conception of virtues and effects.

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[1] *Philosophia botanica* pp. 283 sqq.; already in *DN* pp. 172 sqq.; Otto Hjelt, op. cit. p. 113.

[2] Oswald Croll deals in detail with the signature doctrine in *Tractatus de Signaturis* (1608), pp. 28 sqq.

[3] *DN* p. 186. Linnæus apparently rejects the explanation of F. Hoffmann.

[4] *DN*, p. 173; *Philosophia botanica* p. 287 (refers to the treatise *Pan Svecicus* 1749).

Mind and Nature belong to Linnaeus' explanations of causes and effects. The purposes of Nature are always living realities for Linnæus. The ambiguous doctrine of sympathies covers at times the theoretical need for causal explanations. Here he almost falls back into a magical manner of thinking. His magic is, however, always Natural magic, accordingly depending on reasoning; at any rate it can be ultimately reduced to such principles. When he speaks of the healing effect of plants a conspicuous tendency appears in his reasoning to see in it the signs of a Divine order. He makes a conspicuous use of similarities and contraries as medical principles, but, I think, hardly as explanations of more empirical notions. Homœopathic magic had lost much of its former importance. More recent ideas are involved in contagiousness. It is of some importance to note here that the vicissitudes of the ideas about contagious diseases was a very intriguing question for the contemporary physicians from whom it is possible to learn about the state of scientific progress in medicine. Obviously these various views were also dependent upon the overwhelming physical problem of *actio in distanti* in the science of the period.[1] Concerning such forms of sympathies Linnæus remarks in the *Diæta* that he cannot say if they occur, as some people say, but "the results of experiments would prove this; I have not been given comprehension to observe it".[2] Linnæus' viewpoint is that of an observer, and he consequently admits the possibility of experience beyond the world of the five senses. In principle Linnæus does not even dismiss the possibility which, in our time, could perhaps be called telepathic. Linnæus' personal experiences might have appeared to him in such a light.

Although the sympathetic relationships in Linnæus' account are far from clear, they could permit direct observations of their effects. As magical sympathies we in general consider such presumed causes and events, the con-

[1] Mary H. Hasse, *Action at a Distance in Classical Physics, Isis* 46: 4, 1955, pp. 336 sqq.

[2] *DN*, p. 175.

nection of which remain obscure or occult. As far as the rational explanation of the experience is lacking, from the viewpoint of science, of course such relations must be looked upon as unverified. In so far as Linnæus considers these sympathies to be natural, in any case in the sense of natural magic, the relation between cause and effect is no longer totally obscure. Mutual contacts between phenomena, affecting them partially or completely, are regarded as explanatory of the mysteries of life in a way quite different from their mere similarity. The problems of the expanding natural science of the period lay behind such considerations. Linnæus often gave his attention to them and it can only be said that he scarcely found any other answer than that offered by Aristotle's old theory of purpose being part of cause. Certainly he had a decided need to seek an explanation of the inexplicable in Nature herself. Old and new are thus combined in Linnæus' Dietetic, which includes both learned and popular beliefs.

For Linnæus magic was not just superstition. It was an old theoretical system founded on a knowledge of the connection between the phenomena of nature and expanded into a grandiose philosophy based on life and the world. This philosophy is to be found in the literature of the Renaissance and the Baroque. Although not very much more than remnants of the philosophy of magic prevailed over the common sense of eighteenth-century science, the elementary conceptions of magical thinking still existed in many quarters. The great systematizers of occult wisdom, Pliny and Agrippa, were well-known to Linnæus. And his own systematic mind could hardly remain unaffected by the thinking of the preceding period in medicine and botany. Consequently we sometimes find Linnæus' way of thinking not very far removed from a magical system.

Linnæus points out that his views on magic depend on a threefold foundation (*nititur triplici fundamento*) and he enumerates the various types which, in his opinion, support the theory of sympathies.[1] According to his hypotheses magic is derived from the following facts:

1. *excreta applicata ad alius,*	excretions applied for other purposes,
2. *intentio,*	intention,
3. *attraxio corporum.*	attraction of bodies.

[1] *LN*-MSS, fol. 18r.

In addition to these there are four accidental causes:

4. *electricitas magnetica,*	magnetic electricity,
5. *affectuum actio et natura,*	action and nature of affects,
6. *odoris affectus,*	affects of smell,
7. *metus in odontalgia ab instrumento.*	fright of surgical instruments used to cure the toothache.

The chief arguments in his *hypotheses* may be interpreted as:

1. the products of bodily secretions and excretions may be used for purposes beyond their natural function;

2. human intentions and attitudes of mind may bring about distant effects;

3. animal bodies may possess an attractive magnetic power. The other points may be regarded as rather special cases and are hard to distinguish from those mentioned above.

Linnæus' 'hypotheses' are a general topic of what he calls 'magic'. Their origin is to be found in a mixture of empirical and magical viewpoints. The empirical elements are of a physiological, physical and psychic nature. The magical principle is a doctrine of sympathy, substantially reduced to contagious causation and intentional activity. Theoretically and operatively, this magic is founded upon ideas of living nature, for it never comprises stars, letters or numbers. Natural magic, in contrast with superstition, somehow constitutes for Linnæus credible, although tentative knowledge.

Linnæus' theory concerning magical thinking is not entirely his own. Much of it can be traced back to Jan Baptista van Helmont. Already half a century before Linnæus, in 1683, similar views had been proposed in the thesis *De magnetismis rerum* presented before the Faculty of Philosophy in Upsala by Erik Odhelius (Odelstierna, 1661–1704), better known as a student of mining and chemistry than as a physician. In his sonorous Latin thesis the young medical student expressed medical folklore in terms of animal magnetism, vaguely applying the principle of magic as concept of causality to the supposed effects of magnetic power. His idea is that the 'magnetisms' are effluviating and active forces working not only in material connections but also 'diastatically', at a distance, and perhaps also activating living rather than dead substances. His ideas are derived from the philosophy of older

authors, especially Agrippa, Paracelsus, Van Helmont and Becher. At the same time, however, we can discern in him a future adept of the new sciences.[1] This is apparent from the names of Swedish adherents of Cartesian ideas to whom he refers, names such as the physician Peter Hoffwenius, and the mathematician Johan Bilberg, who presided at the public examination of his thesis. Apart from these two Odhelius also refers to the French physician and philosopher Jean-Chrysostome Magnien (Magnenus), who was a professor at Padua and was known as a revivalist of the atomistic theory of Democritus.

Odhelius' aim seems to have been to try to throw more light on both the old hermetic wisdom and the new teachings on the subject in order to reach consistent, although plainly ficticious explanations. Such an ambiguous tendency would appear to have been not quite unfamiliar in the era of rising Cartesian ways of thinking when Lutheran orthodoxy prevailed. In 1687, the year in which the definite emergence of the New Science at the University of Upsala took place, Bilberg's pupils[2] applied more scientific views to the magnetic phenomena. Certainly, however, the force of the magnet still held the role of a "sheet anchor" for varying occultist views concerning human nature. This force had a rather strange faculty of surviving long after this epoch. Mesmer's animal magnetism is the best known in this connection.

The majority of popular practices and sayings to which Odhelius refers were most probably gathered from the household of Bishop Nicolaus Rudbeck in Västerås (Central Sweden), where Odhelius was brought up. His store of popular items is, however, neither liberal nor notable. Many of the

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[1] Linnæus also refers to a later treatise by Odhelius about *effluvia metallorum*, Brussels 1687. The following passage from a funeral encomium delivered by J. Upmarck reflects the contemporary apprehension of Odhelius' views: *Vidit deprehenditque in humani corporis inextricabili labyrintho, ea in immensis Florae viridariis, ea in chemicis illis vaporariis, queis in succus & liquores metalla diffluunt, quae non Hermeti solum ac Hippocrati & Ægyptiacis quibusque Mystis, sed ante id temporis orbi inaudita erant.* Printed in C. Nettelbladt, *Memoria virorum in Svecia eruditissimorum*, semi-decas II.

[2] The changed attitude concerning magnetism is seen from the theses by A. Plaan and G. Prosperius under the presidium of Professor Bilberg in 1687 (*Dissertatio physica de magnete*, ch. I, th. 1. and *De occultis qualitibus*, §§ 4–8). I am most grateful to Dr. Ingrid Odelstierna for these statements. Concerning William Gilbert see Lynn Thorndike, *A History of Magic and Experimental Science*, VI, pp. 316 sq.

examples are also derived from older literature, even from the days of Valerius Maximus. Here we shall omit the details. The differences between Linnæus and Odhelius in their treatment of method and material would seem considerable. Substantially, however, the core of thought had changed little in spite of the development of science during the intervening period. It is rather astonishing to see how Odhelius and Linnæus agree on the main points. Terms such as *magnetism* and *imagination* are merely changed to *attraction* and *intention*.[1] In several places the likenesses apply even in details. A decisive instance to prove this point is that in the *Diæta* manuscript, whenever Linnæus mentions magnetism, he refers to the works of Odhelius. The following passage from the *Diæta* would appear to be taken from Odhelius:

Magnetismus rerum mirus,
Magnes in ferrum,
morbi contagiosi,
generatio,
Pica in natos,
Nævorum ortus a matre in natos,
Attratrix vis communicata in omnibus corporibus?
Hinc oscula in venerem.

This list[2], which obviously is put down at random, cannot very well be comprehended without the help of Odhelius' work. The account which concerns a vicarious sacrifice of the Massilians, and the note about the ancient custom of mixing blood are taken directly from his work.[3]

This subject is, however, also important in that it gives us the possibility to pin-point a relative date when the *Lachesis* notes on magic were originally written down. If, according to my surmise, the last sections of the *Diæta* manuscript were even partly committed to paper as late as around the beginning of the 1740s, we can presume that Linnæus originally worded his magical 'hypotheses' about the same time.[4]

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[1] Probably the changed terminology reflects a difference in the general concepts of the time.

[2] Details are observed in the notes below.

[3] *DN*, p. 181, also in *LN*-MSS, compared with E. Odhelius, op. cit., ch. I, th. 5. The note *Sanguis* in *Lachesis* also refers to this author.

[4] Concerning the origin of the latter part of *DN*, see my note in *SLSÅ* 1967, pp. 92 sq.

At this juncture it would seem worth-while to consider Linnæus' magical categories for a moment. In the first place we must note the conspicuous importance which he attaches to the contagious relations. This reflects the Linnean medicine at a very vital point. Its somewhat obscure empirical core lies in Linnæus' supposition of *contagia viva*. In his prelections concerning the system of diseases this theory was set out more explicitly. The materials have recently been published and commented upon by Professor Fredrik Berg, Upsala.[1] In many instances the facts do not cover the theories, at any rate not to an extent which would allow any far-reaching conclusions or could be incorporated in a more general order. Conspicuously this disposition of Linnæus' grew stronger during his later years. Rather striking is the interest with which he regarded the mint as an anti-conceptional means.[2] This is not only an idea ascribed to Aristotle but also a curious experience of the mint-water used by his own wife. In the speculative system of *Clavis* several such matters are inserted.

A very important topic for the young Linnæus was the finding of Santorio's old theory concerning the insensible perspiration of the human body. This doctrine was still current and was, in Linnæus' time, among others embraced by James Keill. Very likely Linnæus' discovery of this *canon aureus* saved his little sister in the Christmas season of 1731, from a feverish illness. He placed her in a newly slaughtered sheep's carcase. This surmise seems rather probable, since afterwards Linnæus wrote down the pathetic words that he "kisses Santorio's book". Whatever the truth may be concerning this surmise, it is certain that in many instances in his *Diæta* Linnæus refers to Santorio and Keill. Their names are placed by Linnæus on the title-page of *Diæta*. Keill's work about animal secretions (in Latin 1718) is cited by Linnæus in several places. It is not very strange, Keill says, that bodies conjoined with one another communicate common qualities.[3]

An expression of the presumed effects of the rather miraculous phenomena mentioned above is the term 'attractions' frequently used by Linnæus sometimes in connection with the term 'magnetism'. These powers are conceived as working magically in living bodies. In an additional lapidary

[1] *Linné's Systema morborum, Uppsala universitets årsskrift* 1959: 3.
[2] Hjelt, op. cit., p. 106 (Linnæus, *De Menthæ usu* 1767); *DN*, p. 181.
[3] *DN*, p. 143, cf. p. 49 (Linnæus cites Keill's *Medicina statica*, p. 198).

note to the *Diæta* Linnæus sums up most of what could be considered as such effects: the magnetic influence on iron, contagious diseases, the mutual attraction in generation, appetites in pregnancy,[1] blemishes at birth and even lovers' kisses. Most of these can be found in several places in the *Diæta* and *Lachesis*. More uncertain in this respect seems the suggestion that the power of attraction could perhaps "be communicated in all bodies" (*attratrix vis communicata in omnibus corporibus?*).[2] "Everything has his own exhalations", Linnæus declares in another place.[3]

A large collection of examples from near and far is provided by Linnæus concerning the attractive forces of animal bodies. He refers not only to the well-known story about King David, who is said to have had a young girl in his bed in order to overcome the infirmity of old age. Lord Bacon, to be sure, also vouches for a habit which was still to be found in Linnæus' time. This was to lay a puppy on the stomach in order to remove pain. Linnæus himself refers to two conspicuously well-known cases.[4] Another set of examples of attraction is represented by the tale about the old philosopher Heraclitus who is said to have cured himself of dropsy by creeping into the carcase of a slaughtered ox.[5] The magical character of the foregoing examples unveils itself in the alleged consequence that the animal became infected.

It is noticeable that in this connection magnetism only plays a minor role

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[1] *DN*, p. 207, about the cupidities (*pica*) see op. cit., p. 163. Cf. E. Odhelius, op. cit., ch. II, th. 9.

[2] *DN*, pp. 207 sq. Presumably Linnæus means dead bodies. Linnæus must here be referring to E. Odhelius, op. cit., ch. II, th. 12: *Neque vero metallis adeo frequens competit Magnetismus, ut eundem produnt vegetantia.* A rather curious note is (*DN*, p. 208) that the people in Dalecarlia used to put warm loaves in the bedding in order that the *miasmata* would disappear. Probably this information was delivered to Linnæus in 1734.

[3] *DN*, p. 66. When, however, Linnæus maintains that even the shadow of the gallows (*umbra arborum noxiarum*) may be harmful (*LN*, p. 84) we cannot but imagine that he pays tribute to popular superstitions about gallows during his own times. Cf. Johan J. Törner, *Samling af widskeppelser*, ed. by K. Rob. V. Wikman, 1946, passim.

[4] A reference is also made to Agrippa of Nettesheim: *Sic tradunt in torminibus anate viva apposita ventre transire anatemque emori. Occulta philosophia*, l. I, c. 21, cf. c. 37. Similar views are held by E. Odhelius, op. cit., ch. III, th. 6, who also refers to the standard example of King David in I Regum 1.

[5] *LN*, pp. 72, 83–84; cf. MSS.

in the magical thinking of Linnæus. The connection between magnetism and electricity remained essentially as obscure as before. It is uncertain what he means when he declares that "the life and the spark of life live in free air of electricity".[1] Very likely such utterance of Linnæus ought to be seen in connection with his almost material conceptions of life and the soul.

However, applying mechanical terms to physiological phenomena could never be the same as to generalize mechanistic arguments from nature. When Linnæus speaks about the body as a *machina pneumatico-hydraulica*, in analogy with the Clepsydra of the old Greeks, he did not forbear to say that this machine was governed by life itself (*moderatus a vita*).[2] For him a purely physical reasoning could hardly explain anything. As long as electricity remained obscure, it does not seem quite erroneous to say that Linnæus, at times anyhow, had a tendency to identify his *electrum* with the fifth element, *æther*. For him electricity was "a recent innovation".[3] It was credited with the ability of maintaining and nourishing the nervous system.[4] And still more this fine and fugitive ethereal substance or force had the virtue of transmitting the vital spark from one generation to another in the chain of living creatures.[5] In spite of all that can be said about these grandiose views, they express a groping effort to give some explanation of life's dynamics, and to open a door for new aspects on the underlying great problems.[6]

The most important part of Linnæus' magical physics is hidden in his doctrine of the sympathetic association of contagiousness involving the whole and its parts, which forms the essential substance of his views on the bodily fluids and excretions. At first glance these materials could perhaps be taken

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[1] *LN*, p. 82.

[2] *Clavis medicinæ duplex*, p. 5. About the Clepsydra-idea see J. Schumacher, *Antike Medizin*, pp. 115, 117, 138.

[3] *Electricum recens inventum, alia machina artificiosior. Clavis* MS: *Electricitas.*

[4] *Character: fluidum siccum, lenissimium, invisibile rarissimum, volubile, citatissimum, elasticum, non coercendum, sopitum excitandum.* Ibidem.

[5] *Electricitas in ovo, separato a matre.* Ibidem.

[6] Linnæus thought that the concomitance of respiration and circulation showed that not only the lungs but also the brain were receptacles for the electricity in the air. (*Cerebrum habet systole et diastole syncronum pulmoni, non cordi. Pulmo agit in cerebrum.*) At the same time he believed that the medullar substance biologically was the seat and transmitter of life. (The aphorisms 18–21 above p. 21, Clavis MS, *Pulmo.*) See *Clavis* p. 11; *Egenhändiga anteckningar*, ed. by Adam Afzelius, Stockholm 1823, p. 201; O. E. A. Hjelt, op. cit., pp. 166 sq., 238 sq.

from the old store of magical medicine. However, this would be to underrate the serious intention of Linnæus. In reality his arguments go deeper than that. When he puts blood on a par with other bodily fluids, his supposition is that these, as for instance the genital fluids, had their origin in the blood. In other cases the secretions and excretions are regarded as "unclean" and objects of general disgust not only in the human but also in the animal world. His personal distaste not only for nasty-smelling substances such as menorrheal fluid and genital odours but also for the abominable smells of the slaughter-houses in Stockholm and in Paris are vividly described by him. "We commonly flee from such odours", he says.[1] With a realism peculiar to his style he describes the fright of lowing cattle, when sensing the smell from the slaughter-houses. In these cases Linnæus evinces a keen interest. From several utterances made by him it seems likely that he was very sensitive to the shedding or flowing of blood.[2] Curiously enough the same is said about Pliny and Galen.[3] His sensitiveness to odours belonging to the sexual sphere is shown in many places. In his speculative pharmacology from his later years Linnæus argues that tastes and smells come from effluvia working separately on the nervous system. Strong odours, especially from plants, are regarded as affecting the medullary part of the body.[4] The occult virtues have merely been changed into obscure forces.

It is plausible to suppose that Linnæus was affected by such impressions when he generalized his views in terms of traditional magic and religion. His sources are partly his own, and partly known and less known, even obscure, authors from older times. He is especially fond of citing the Old Testament and particularly the Pentateuch as authorities for magic. "Blood is soul" it is said in the ritual text of *Deuteronomy* XII, 23, and Linnæus seems inclined to give the Old Jewish sacrifices an exegesis in terms of sympathetic magic. He refers to an old saying that Moses was imbued with Egyptian magic.[5] The scapegoats are also interpreted in similar terms.[6] It is not very astonishing

[1] *DN*, p. 154.

[2] The following passage is noticeable: *Sanguis hunc fugimus; horreo adspectum sanguinis fluentis, uti menstruum. Menstrua ut inde abhorrent omnes; adhuc leuchorrheæ. Transpiratio libidinosa puellæ. LN*-MSS, p. 18, cf. *DN*, p. 113.

[3] Lynn Thorndike, op. cit., I, p. 167.

[4] Otto E. A. Hjelt, op. cit., pp. 105 sq.

[5] Without naming the author Linnæus (*LN*-MSS, fol. 18[r]) cites Agrippa of Nettesheim, *Occulta philosophia*, l. I, c. 47.

[6] *Leviticus* XVI.

that the saying "blood throws up the soul" is attributed to Homer,[1] and that Kenelm Digby's famous sympathetic powder for arresting a hæmorrhage at a distance is vouched for among Linnæus' notes.[2]

Although Linnæus' ideas of sympathy are extremely vague, some of them seem to be held in common with Boerhaave in his lectures *De morbis nervorum* in the spring of 1735. Boerhaave develops the theory that the sensations are transmitted to a *sensorium commune* where they generate emotions that bring about active and reactive effects in participation with other individuals. The original cause of this process is God Himself.[3] Here Boerhaave adopts an occasionalist view, which, however, is not to be found in Linnæus. But when the latter includes emotional expressions of joy, fear, etc. among the sympathies, and presumes that birthmarks may result from such causes, he essentially adopts the same attitude as his teacher. As for the birthmarks, though, both Boerhaave and Linnæus take a questioning and sceptic view; mainly perhaps because the effects appear to resemble their causes rather than to derive from them.[4] The touch of magic is manifest.

In the Linnean magic the list of bodily fluids and excretions is fairly comprehensive. It includes not only blood, menses and genital fluids, but also sweat, saliva, urine, fæces, pus and similar fluids, which are listed as substances. Most of this is to be found in the magical medicine of old times. Much of the material is reproduced in Pliny's encyclopædic work and is also systematized by Agrippa of Nettesheim in *Occulta philosophia*. But without saying any more it is clear that in his medical practice Linnæus was familiar with such primary physiological facts. His way of mentioning them is always that of a physician addressing his pupils.

Linnæus gives a very central place to the female periods. This is not very remarkable as this was the subject of observances and taboos from the re-

[1] The cited passage: *purpuream evomit animam* obviously refers to *Ilias* XV, 360, rendered from some obscure source.

[2] *DN*, pp. 49, 176.

[3] About the Boerhaavian concept of sympathy see B. P. M. Schulte, *Hermanni Boerhaave Prælectiones de morbis nervorum 1730–1735*, Leiden 1959, pp. 261–273, 389–391.

[4] Συμπάθεια *hæc est, in gravidis imprimis, adeo sæpe efficax, ut omnino sæpe mirabilitatem excedat. Nec tamen ideo negare audeo rerum historiam quia quomodo fiat ignoro.* Op. cit., pp. 266 and 276.

motest times and also of cosmological speculations about the lunar influences on human life from the beginning of historical time-reckoning. Linnæus was no longer very impressed by the astrological doctrines when he was told of a possible connection between his headaches and the phases of the moon. In fact he could not believe in any such connection.[1] In these matters Linnæus refers to a passage in *Occulta philosophia*, where Agrippa declares that in ancient times menstruation was looked upon as being most venomous, and he gives a long list of evil effects brought about by sorcerers with menstrual fluid.[2] Linnæus gleaned several items from Swedish folklore. He tells us that women had confessed to him about having used menstrual fluid in order to snare men, although with very perilous effects. In two cases, women are said to have utilized their own menses as enchantments, but had been taken very ill as a result. A country-girl is said to have applied her first menses for similar purposes. The menstrual blood is said to have the double quality of procuring love and expelling evils, but the danger of such practices is that the woman's fallopian tubes become obstructed, or even fail to produce eggs. A remedy for this is to take another woman's menstrual fluid in order to resuscitate one's own.[3] Already in *Diæta* Linnæus observes the particular qualities attributed to the first menstruation, an idea which is well-known in contemporary and later folklore in Sweden.[4]

In accordance with embryological notions still held in his time, Linnæus supposed that the genital fluids of the woman as well as the man were active constituents at the conception. *Genitura* was the term not only for sperms but also for the genital secretions of the woman. The supposed connection with

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[1] MS in the Linnean Society of London (D. 807, c. 1), kindly communicated by Professor Fredrik Berg, Uppsala. In *Varia*, *DN*, p. 208, Linnæus puts down some notes, taken from some unknown source, concerning alleged influences of the moon on the brain and the oysters.

[2] *LN*-MSS; Agrippa, op. cit., l. I, c. 42. The subject is treated by E. Odhelius, op. cit., ch. V, th. 5, where *inter alia* is said that the blood retains its connections with the human body but also has effects in other circumstances: *Declarant id abunde menstruatæ, quarum aspectu non solum citissime defœdantur specula, sed & totam cerevisiæ fermentationen adventu menstruatæ vi quasi destructam ocularis comprobavit experientia.*

[3] *LN*-MSS, fol. 18. The sperma as love-charm, ibidem. The notices are conspicuously of literary origin.

[4] *DN*, p. 201, and *LN*-MSS, cf. L. F. Rääf, *Svenska skrock och signerier*, ed. by K. Rob. V. Wikman, Stockholm 1957, No. 1883.

the blood is very often emphasized in terms such as *flos sangvinis* or *quinta essentia* (of the blood).[1] Also sweat and spit are regarded as *puræ serum sangvinis*, "strained out of the blood".[2]

Lovers' kisses are likewise listed among these magical substances.[3] The table of secretions contains several other substances of the ancient magical pharmacy, such as afterbirth, pus and *stercora* in popular use.[4] A note from Linnæus' Lappland journey is significant in this connection: The Lapp spells a bear charm on his neighbour's reindeer in this way: whilst walking in the forest he collects some warm bear dung, which he then places in his armpit (*sub axillis*). Next he takes some warm dung from his neighbour's reindeer and in this way the bear charm is cast upon the reindeer. The only way to remove the spell is to throw the charm into (running) water. This practice of the Lapplanders became, for Linnæus, a type of sympathetic magic, and it is rendered as such both in *Diæta* and in *Lachesis*.[5] The magic art is rather complicated. It can be sub-divided into: the view on the virtue of the substance, the taking care of it, the mixing procedure and the intentions connected therewith. The occult virtues attributed to these products of the bodily functions are naturally central facts. However, the collecting and mixing together of the magical elements and lastly their application to evil purposes are just as important parts of the operation and must be held together as one whole.

We learn from Linnæus just how complicated and entangled with magical elements medical traditions became in the course of their long history. In this context he mentions congenital defects of children, such as birthmarks, hare-lips and fire-marks, which were acquired by the unborn baby during the mother's pregnancy.[6] Linnæus only touches on the theme but, in his

[1] *DN*, p. 110.

[2] *DN*, pp. 57 and 99 sq.

[3] *LN*-MSS, fol. 18: *Solus odor virosus excitat membrum ac genitalia. Oscitando imo oscitat alter. Solus tactus utriusque genituræ effecit hominem summum magum.*

[4] Ibidem.

[5] *LN*-MSS; *DN*, p. 176 (where *bron* is to be read *biörn*, 'bear'). Cf. the author, *Carolus Linnæus i Vasa och Österbotten, Budkavlen* XXXIX, 1960, p. 103. A somewhat simpler form was practised by Swedish peasants, and Linnæus refers to this: *Ferro candente urunt stercus inimici ut inde exulceretur podex. LN*-MSS ibidem. Cf. at large E. Odhelius, op. cit., ch. IV, th. 3, where mother's milk and urine are treated in this connection.

[6] See above the sympathetic theory of Herman Boerhaave.

Diæta, in accordance with advice in Hippocratic medicine, would appear to warn against incontinence before childbirth.[1] From his own experience comes a story from Lappland, where he tells us about a pregnant woman who had looked upon her dying mother with the result that her child was born with an eye-defect. According to his requirements Linnæus brings to the fore a couple of parallel stories from the animal world and also narrates the story of how Jacob stripped the rods in *Genesis* XXX, 37–39. Linnæus, however, reacts vehemently against the opinion that original sin causes complications during delivery. The touch of magic appears here as clearly as it does in the short note of Linnæus that a strawberry-formed birthmark might originate from throwing a berry at the child's mother. When the berries ripened, it is said that the moles turned red.[2]

The magic was not so much concerned with the friendships and enmities of things (*amicitia* and *lis*, φιλία and νεῖκος, in ancient conceptions), as with bringing them in contact with each other in order to pursue the intentions of the practitioner. This aspect of the practice is well illustrated above by the account of the bear-charm in Lappland. According to Linnæus' 'hypotheses' intentions (*intentiones*) and attitudes (*affectum actio e natura*) are considered as subjective causes of magical actions. A leading motive is that "faith moves mountains", by which is meant that vows, oaths, curses and imprecatory attitudes can trigger off magically acting powers in accordance with sympathetic principles. Unfortunately the words are used in such a broad sense that they can scarcely clarify much of Linnæus' hypothetical reasoning. The main argument seems to be in harmony with the principle of destiny, which, in this connection, is illustrated by examples of the self-cursing effects of broken vows in love affairs. "Perhaps one's own conscience contributes to such a condition", Linnæus says, completely in the manner of *Nemesis Divina*. However, the magical basis of his reasoning becomes more clear when he refers to behaviours such as anger, appetite or

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[1] *DN*, pp. 114 sq.; cf. *LN*, p. 150.

[2] Such ideas were current in Småland but also—in England. *LN*-MSS, fol. 18: *nævi baccarum efflorescunt eo tempore, quo rubescunt baccæ*. For the interpretation above I am indebted to T. Fredbärj, M.D., Stockholm, who kindly informed me of a lecture-note made by Stephen Insulin in 1753, in the Library of the Royal Swedish Academy of Sciences, cited by Felix Bryk, *Linné as Sexualist*, Stockholm 1951, p. 45; see moreover F. J. E. Enestrom, *Finnvedsbornas seder och lif*, 1911, p. 74.

hunger as occult causes for what he calls intentions.[1] However, his thoughts can scarcely be expressed in terms of modern psychology. Moreover they belong to the history of magic.

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[1] *LN*-MSS; cf. below ch. III–IV. In this connection it is remarkable to note the slight behaviouristic observation taken from the "experiments" in the Royal British Society: *Caudisona videns Sciarum in arbore, aperit os, diu timet animal, tandem os incurrit. Sic et mures.* It seems likely that Linnæus seeks an explanation of these conditional reflexes in the wonderful order of Nature. It is not surprising that in another place Linnæus calls his own subjective uneasiness at the birth of his first child and the death of his mother as telepathic "intentions".

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In a little treatise called *Metamorphosis humana*, 1767, Linnæus develops an old theory about the seven-year periods of human life. The reasoning was familiar to Linnæus already in his *Diæta* of 1733. Here he reckons with at least six periods of seven years in accordance with the following list, which characterizes the changes of youth, manhood and old age:

Laxus, fortis, rigidus,
humidus, plenus, siccus.

In the context Linnæus promises a dietetical exegesis of the last chapter of *Ecclesiastes:* "Remember now thy Creator in the days of thy youth."[1] He returns to the same topic later in his prelections. In the college-notes he still reckons with six such periods of life; manhood is, however, doubled to fourteen years before the *annus climactericus fatalis* ensues in the 63rd year of life.[2] In the text of *Lachesis* the *critici anni* are indicated as ten periods of seven years with 70 as the limit.[3] In the treatise of 1767 the perspective of the years is stretched out to 80. The subjective character of the reasoning is, as Professor Sten Lindroth remarks, obvious enough.[4] This becomes even more significant when we find the ponderings of Linnæus about the flight of years resulting in the thought that the summit of life occurs at the 48th year. This is a marvellously exact date (about the beginning of the 1750s) for the end of the scientifically most productive age of Linnæus. We can scarcely be mistaken that Linnæus is here reflecting on himself. In *Vita II* he considers 1748 as the fatal year.[5] Most of his remaining years were filled with recurrencies, reminiscences or sudden conceits. Nevertheless Linnæus was a man of ready wit, as Lindroth aptly observes.

It would be tempting to guess at a magical explanation of the number 7 in

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[1] *DN*, pp. 40, 42.
[2] *LN*, the college-notes pp. 5 sqq.
[3] *LN*, pp. 13–16.
[4] Sten Lindroth, *Linné — legend och verklighet*, *Lychnos* 1965–1966, p. 104.
[5] *Vita II*, p. 20.

Linnæus' meditations. In fact, Agrippa of Nettesheim has a great bulk of examples in his 'Scale of septenaries'. *Inter alia* he says: *Cum vero ad decadas septenas pervenitur, ubi septenarius per numerum completum conducitur, tunc metam communem vivendi habet, dicente Propheta: Dies annorum nostrorum in ipsis septuaginta annis. Summus etiam humani corporis crescendi modus, est septem pedum.*[1] The text of Agrippa tells us almost all we need to know. Also Ficino says that dangers threaten every seventh year of life.[2] The periodizing of the human lifetime in septenaries is biblically founded on Psalm 90, verse 10 in the *Psalms*. Philo deals in particular with the theme which shines forth in Cicero's 'Scipio's Dream,' where fifty-six (7×8) signifies Scipio's fatal year.[3] Ultimately the idea is derived from archaic astrological views on the seven planets.[4] Besides Linnæus calculates with twelve as a multiple for months and days.[5] It could be suspected that such numerological and astrological notions were directly taken from Trithemius' and Agrippa's scales.[6] The latter speaks expressly about the numbers seven and twelve: *Habet septenarius magnam cum duodecimo conformitatem.*[7] But nowhere in Linnæus' production do we find such astrological notions.

It is another matter that instead Linnæus introduces Microcosm and Macrocosm in accordance with the formula: "What is inferior, is also superior."[8] The train of thought is conspicuously platonizing in the Renaissance sense. On the other hand we may suppose that behind this guess-work there is a vague view about a clock let into the organism and determining human nature. Van Helmont's ingenious idea of Biological time, however, seems to

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[1] Op. cit., l. II, c. 10, pp. 114 sq.

[2] *De vita studiorum*, ch. 13, 14, 20, cit. by Thorndike, op. cit., IV, p. 564.

[3] Thorndike, op. cit., I, pp. 355 sq. (*De mundi opificio* c. 30–43); 273 (*Somnium Scipionis* c. 2); W.-E. Peuckert, *Astrologie*, 1960, pp. 266 sq. (Ptolemy, *Tetrabiblion* l. I, c. 2).

[4] A survey of Linnæus' aspect is inserted in the cited *Dissertatio medica sistens metamorphosin humanam*, Upsala 1767, p. 19. About the *Scala septenarii* see Agrippa, op. cit., l. II, c. 10, pp. 114 sqq.

[5] Agrippa, op. cit., l. II, c. 10, p. 119.

[6] J. Trithemius in the edition of the *Occulta philosophia* by Karl A. Nowotny, Graz 1967, Appendix V, pp. 715 sqq.; cf. p. 439.

[7] Original edition of *Occulta philosophia*, loc. cit. and pp. 130 sq: *Magna insuper in divinis mysteriis duodenariis vis est.*

[8] C. von Linné, op. cit., p. 3. Cf. *Calendarium Floræ*, Upsala 1756, p. 1.

have passed unobserved by Linnæus.[1] Walter Pagel aptly comments on the striking contrast concerning the time-conception between the Platonism of Plotinus and Proclus and the Aristotelianism on the other hand which goes back to the Middle Ages and continued into Modern Times: "In the Peripatetic philosophy time", he points out, "had assumed the character of a universal framework, completely unrelated to the qualities of objects or the differences between them."[2] On the contrary, time, according to Plotinus, "was an offspring of eternity, occupying a position, independent of motion and number". A faint hint of neo-Platonism in Linnæus cannot be overlooked in this context.

Linnæus' treatment of magic may seem rather bewildering. Behind his natural magic is, however, dimly seen concepts of connections of cause and effect, no longer attributed to devils or spirits but to "intelligences" or "powers", whatever they are called. Linnæus also has an apparent respect for magic as a source of knowledge. According to his 'hypotheses' the magical connection could be made active through human sentiments or intentions.

Linnæus' scientific world was still one of discovery and adventure such as it had developed during an epoch when arguments were governed by intentions and contents by form. The dimensions of time and space had no limit. The enormous widening of the world of experience led above all to the posing of problems on the way knowledge had to travel before it could gain order and create systems. Linnæus took over this task and his morphological systems became a dynamic core which later could form a basis for evolutionism. In his plant-medicinal system Linnæus, however, also included other concepts and elements of thought from pre-scientific traditions and presented 'hypotheses' concerning sympathetic connections in nature. Although empirically confined to a form which may be labelled as rather magical Linnæus himself was never a magical thinker. The pre-scientific elements in the philosophy of Linnæus will be further illustrated in a chapter about what may be called his hidden philosophy.

[1] The theory of a biological time was proposed by J. B. van Helmont, *De tempore* 1648, who deprecated not only the analogies between macrocosm and microcosm but also the sympathy-doctrines. W. Pagel, *J. B. van Helmont, Osiris* VIII, 1948, pp. 346 sqq., 355 and 372 sqq.

[2] Concerning the Paracelsian time-conception Walter Pagel, *Paracelsus*, Basel and New York 1958, pp. 72 sqq. The author is referring to Joh. F. Callaghan, *Four Views of Time in Ancient Philosophy*, Cambridge, Mass., 1948. See also the discussion of the problem by Helene Weiss, *Osiris* VIII, 1948, pp. 418 sqq.

II. Popular Faith

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The scope of Linnæus' anthropological Dietetic, as already pointed out, was very wide. It includes not only the ways of human living but also a great field of behaviour such as customs and beliefs, for example maypoles, bonfires, curing-wells or the spending of holidays with their charms and omens. To a certain degree Linnæus notes down such matters for amusement, or as anecdotes when illustrating his more serious efforts of presenting the natural manners of simple people. Narrated folklore is almost totally absent here. Black arts and demonic witchcraft were soon out of date in the science of Linnæus' time.

The traits of provincial beliefs and ways of life in remote districts of Sweden in the eighteenth century are certainly of interest to the folklore-topography of our day. However, they are still more characteristic of Linnæus' own personal interests and hence should be considered here from this point of view. Linnæus himself had all the equipment of a good ethnographer and also took an interest in comparing his findings with similar conditions in several provinces of Sweden and even in foreign countries. His mode of rendering such matters in the Swedish language can hardly be surpassed. It is therefore a pity to render them in another tongue.

In his dietetic Linnæus treats superstitions, charms, spells, omens and divination under the heading of *animi pathemata*, a headline word of ancient date, perhaps best rendered with emotive attitudes of mind. Linnæus makes a very noteworthy distinction between *magia* and *superstitio*. From the term magic he excludes false and unlikely representations, such as "the prediction of things to come, changing oneself into other shapes, making oneself invisible, being able to fly through the air ('riding to Blåkulla'), being able to walk dry-shod on the water, giving life to soulless things, being able to call up the spirits of the dead, shades, dead people, demons, to subjugate ghosts, to procure oneself an honorary position, to find hidden treasures, always having money at hand ('pecuniam reducem semper habere'), to be always invulnerable to weapons ('to withstand'), not to be hurt by fire and

water, to put a spell on somebody's mind in order to attach his feelings to something, to inflict illnesses or a state of stupor (*sopire*), to mumble words, transference (*injectio*), pictures."[1]

According to Linnæus magicians have never maintained such things. They belong in the repertoire of superstitious people and old women.

O caecas hominum mentes, o pectora caeca.[2]
Plebis deliria. Aniles fabula.

Linnæus hereby differentiates between magic and all forms of what is known as witchcraft and sorcery. At the same time he negatively defines what he means by superstition. It is however obvious, that such definitions must partly overlap. Evidently this is the case when he heads ghosts and "idolatry" separately or couples sympathies with magic, which we are obliged to keep together. A modern anthropologist would, without further ado, separate the elements of belief and performance from one another, especially in connection with faith in nature's spiritual beings.[3]

Linnæus' first known literary work, his *Örtabok*, is a herbalistic notebook which contains information on plants grown for medicinal and domestic purposes and their attributes and uses. The contents of this notebook, which was written by Linnæus at the age of eighteen, has hardly any scientific value, but it does show how Linnæus came to choose a scientific career and how this was determined by his own interests and his knowledge of the botany and medicine which he had acquired from his teacher, Johan Rothman. Sometimes Linnæus made notes concerning his surroundings, but at that time he appears to have lacked a more genuine interest in what the people in the countryside practised in they way of household remedies. Occasionally he did try them, but certainly more in jest than in earnest. However, all such subjects could not have been missed by him. Some leanings towards the old science of the occult are noticeable in the drawings of

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[1] *LN*-MSS; transl. from the Latin text.

[2] *LN*-MSS; Linnæus quotes from memory Lucretius, *De rerum natura* II, 14: *O miseras hominum mentes, o pectora caeca!*

[3] K. Rob. V. Wikman, in: *The Supernatural Owners of Nature* (*Stockholm Studies in Comparative Religion* 1) ed. by Åke Hultkrantz, Stockholm 1961.

trees and the explanations attached to them.[1] His library in his early days also contained a good deal concerning such matters. His studies in medicine had perhaps also some connection with these literary interests. Boerhaave once said: "Credulity is hurtful, so is incredulity: the business therefore of a wise man is to try all things, to hold fast what is approved, never to assign limits to the power of God, nor assign bounds to nature." Without any doubt such views became lodestars for Linnæus in future days.

Anyhow it is very remarkable how early Linnæus paid attention to the popular beliefs of his native surroundings. During his journeys in the Swedish countryside he did not neglect the medical plants, considering that Nature had once and for all given the plants the power to cure. In many cases the differences between empirical and fictitious folk-traditions are nowadays as difficult to define as they were in Linnæus' time.

When in 1728 Linnæus went to Upsala, he probably took with him a manuscript on folk beliefs, entitled *De reliquiis Paganismi et Papismi in Smolandia.* The original has been lost, but no less than three copies are preserved. One of them was obviously made by a friend and fellow student, Carl Fredrik Mennander, who became a Professor and Bishop of Åbo, and then Archbishop of Sweden. The other two copies date from the late 1720s and were made by two other students at Upsala, Daniel Torpadius and Johan Johansson Törner.[2] Another of Linnæus' early friends, Johan Browallius, later Professor and Bishop of Åbo, may have owned a copy (it could possibly have been the original). The handwriting can be traced to the late 1600s or early 1700s. Some statements, probably by Linnæus himself, have been added in the copy by C. F. Mennander. They occur once more in the unpublished section of *Lachesis naturalis.* It looks as if the original had already disappeared when Linnæus travelled to the islands of Öland and Gotland in 1741 and visited his home county on the journey.

Nevertheless Linnæus appears to have had folk beliefs and medicine in mind all the time during his long journey to Lappland in 1732. Observations

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[1] See *Örtabok*, figs. III–IV, with ref. to J. G. Müller, *Deliciæ hortenses*, Stuttgart 1684, pars prima, pp. 230 sq.; listed as no. 168, 169 in *Caroli Nic. fil. Linnæi Bibliotheca Medica*, p. 25.

[2] *J. J. Törners Samling af widskeppelser*, ed. by K. Rob. V. Wikman, Uppsala 1946.

of such matters were in keeping with his aims and the planning of his journey. His aims are evident from his notes concerning *Diæta naturalis 1733*. With the exception of the scientific results from his Lappland journey which to a certain extent were laid down in his famous *Flora lapponica* 1737, the notes from the journey and the dietetic remained unpublished. Only some years ago when *Diæta naturalis* was published it became possible to comprehend the close connection between Linnæus' two early works. The young traveller's notes concerning religion and magic show his great interest not only in Lapp shaman-drums and medicines but also in the superstitions of the Finnish and Swedish inhabitants of these northern provinces of the realm. During the journey to Holland 1735–1738 Linnæus adds some general comparisons between Lapps, Siberians and Indians ending up with the remark that "The Doctrine of God is amazingly variable". About the Lapps it is said that they worship thunder, evil spirits and deceased persons. "When they fall ill they say that deceased relations are longing for them; the dead are then offered images, which are buried."[1] A comment on these notes must be omitted here, so much more as Professor Åke Hultkrantz has recently treated this subject very competently.[2]

Linnæus' wide interests obviously became stimulated in 1741 when he renewed his connections with his native county. Apart from folk-botany and folk-medicine the purely folkloristic notes from his later journeys in different parts of Sweden are sparsely represented. Suddenly, however, popular beliefs burst into bloom in his descriptions as he approached the neighbourhood where he had spent his childhood and schooldays. Recollections and stories had almost the same effect on him as the flowers of his youth. He felt proud of the monument which was left by his ancestors in the form of stories, traditions and opinions. But this does not mean that he believed in the stories propagated by the people.[3]

This general attitude of Linnæus to superstition, animism and magic pervades all his literary works. Superstitions are in themselves *plebis deliria.*

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[1] *DN*, pp. 192 sq.

[2] Cf. Åke Hultkrantz, *The Healing Methods of the Lapps, Papers on Folk-Medicine at an Inter-Nordic Symposium*, Stockholm 8–10 May 1961, pp. 325–351 (*Arv* vol. 18–19, 1962–1963).

[3] *Carl Linnæi öländska och gothländska resa*, pp. 307 sq., 320.

All Linnæus says about spirits and ghosts is that the question of their existence is difficult to answer. "Natural scientists hotly deny it, and why not when they are not of a corporeal nature. All knowledge of them defies positive observations. Dutchmen, Lapps and other peoples know hardly anything about them. Ordinary people, people from Småland, think that they see spirits and ghosts in the woods at night. Most people's panic-stricken fear is a child of the imagination. To be afraid of the dark is an illness, a habit which is implanted in children so that they dare not venture out into the dark and to stop them crying at home."[1] Consequently Linnæus tries as far as possible, to explain such phenomena in a natural way. In contrast to the conceptions mentioned here we do find natural magic.

The collection of superstitions from the journey in 1741 deals mostly with the traditional customs of the country people. They have been quoted and copied very frequently. The original annotations which are preserved in the records of the journey in the Linnean Society in London differ in certain respects from the diary edited and published in 1745.[2] The rough draughts show that most notes ought to be dated to the 14th and 15th of August 1741. In the original diary for the 15th of August 1741 we read: "We came back to the Smålandic beliefs which are rather comprehensive." The words hint that earlier in the day such matters had been under discussion with his teacher and friend Johan Rothman. Perhaps they had also been discussed in some larger circle. There is much to show that these notes were based on hearsay from the parental surroundings of Stenbrohult a few days before. Most of the notes deal with rustic festivals and beliefs. Four years later when Linnæus arranged the manuscript for publication he left out notes which, presumably, might have been offensive to a wider public. For some unknown reason the notes were redated to the 5th of August, and in one case to the 13th of August 1741.

There can be no doubt that the large majority of Linnæus' records, published and unpublished, concerning folk-beliefs originate from Småland. Notes on superstition in his descriptions of the later journeys in other Swedish counties are comparatively few. Notes of this type from his journey

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[1] *LN*-MSS (*Spectra*).

[2] The records from the journey have now been edited by K. Rob. V. Wikman. *SLSÅ*, XLVII, 1964, pp. 16 sqq.

in Västergötland in 1746 are more concerned with folk-medicine and folk-botany. In the spirit of the times Linnæus remarks that Natural history "banishes superstition and forms a basis for all Private Economies and Manufactures on which the well-being of the Kingdom depends".[1] Although on these later journeys he does not neglect popular customs and similar things, he omits curiosities which do not directly belong to any of Nature's "three provinces".[2]

The *Lachesis* papers, however, contain a large number of notes about popular superstitions which have been added later. According to some early statements in the anonymous manuscript *De reliquiis*, mentioned above, it is likely that Linnæus compiled a whole collection of superstitions of older or newer date for his lectures. The part of the *Lachesis* manuscript which has the title *Superstitiones* covers 4 close-written pages in folio, comprising altogether c. 110 items.[3] With the addition of a number of statements about folk-beliefs, which Linnæus inserted in other parts of *Lachesis* and *Nemesis* as well as in his printed papers, one can venture to say that his notes form a very considerable collection. Surely, this was the "pretty argument" he himself had in mind when he spoke about such collections.

Notes concerning household cures, very often rendered in medical terms, are scattered in many places. In direct connection with the Smålandic superstitions he reports on a couple of such practices. Under the title *Kloka* ('Wise women') we find the strange story of a woman, Ingeborg from Mjärhult.[4] The story relates that she could describe the illnesses of her patients simply by handling clothes which had been worn by them. She thought that everybody has a double which follows him, and like a reversed reflection in calm water, *uti Narcissi umbra*, follows him as an antipode in a position downwards. If the double should injure an underground spirit, a *vätte*, *älva* or *rå*, the person fell ill. The illness was cured by pouring out milk or something similar at a certain time into a northbound stream, on a cairn (Swedish *rös*), a tree, or in a churchyard (as far as one can see, the place

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[1] *Carl Linnæi Wästgötaresa*, printed in 1747, pp. 241 sq.

[2] Op. cit., p. 210.

[3] *LN*-MSS fols. 19–20 (to be printed in *SLSÅ*). Cf. *Öländska och gothländska resa*, pp. 28 sq, 308–311.

[4] *LN*-MSS; cf. op. cit., pp. 312–314.

where the illness was supposed to come from). In this last respect the practice differs little from other cures of similar kinds. The strange conception of the human double which Ingeborg is said to have entertained, is amazing and has caused a good deal of discussion among folklorists and researchers in religious history.[1] This story has no parallel in Swedish folklore and could almost be regarded, if not as apocryphal, at any rate as a piece of peasant philosophy. Another wise woman, whom Linnæus met during his journey in Västergötland in 1746, maintained that "the earth had turned round so that the seasons had changed".[2]

Up to the days of Linnæus the structure of popular thought was still highly homogeneous in the central provinces of Sweden. The traditions were a common heritage and the superstitions were practised more or less among all classes of the population. This is clearly shown by the extensive collection of superstitions compiled by Johan Törner, D.D. (1712–1790), a schoolmaster at the Linköping Grammar School in Central Sweden. As a physician Linnæus was a zealous combatant against the widely spread quackery. Especially he was a sworn enemy of curing *per expectationem* which the adherents of G. E. Stahl recommended. A sick person, Linnæus repeatedly says, is like a ship which needs a competent pilot. "In a calm wind" even "an ignoramus" can pilot a ship. It is, however, inexcusable "to place all one's possessions in such unsafe hands".[3]

It is, however, surprising to find that Linnæus was not impervious when it came to bear on the mind. On the contrary he was eager to test whatever looked like being an explanation of popular beliefs. For this reason his ideas concerning magic acquire importance not only for the understanding of his science but also of his own private thoughts. If he could not clarify the difference between magic and superstition, this was because the explanation of sympathetic magic and superstition must be sought in a common source, viz., the sense of the unknown.

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[1] G. O. Hyltén-Cavallius, *Wärend och wirdarne*, I, Stockholm 1864, p. 355; Erland Ehnmark in *SLSÅ* XXVII, 1944, pp. 83 sq.

[2] *Wästgötaresa*, pp. 100–102 concerning Sven i Bragnum (cf. the note pp. XXVIII–XXX and corrections and literature quoted by Natanael Beckman in the reprint, Upsala 1928).

[3] Ibidem.

In *Lachesis* Linnæus has put together a collection of statements, his own and others, under the title *manes* (*hamn*). These concern auditive and visionary hallucinations, death omens and such things. He opens up with the words: "I deny the rest, whatever they might be, I do not know."[1] "The rest" probably refers to his notes on ghosts (*spectra*), which are to be found on the opposite page. When Linnæus is questioned as to the existence of doubles it is obvious that his faith is nearly undoubted. We also meet with this firm belief in *Nemesis divina* from which the following notes are presented in their original form.[2] Preceding the Latin text Linnæus writes the following sentence: "According to what many people say (*multorum ore*), banging is heard from the walls before someone dies." In another place the word *manes* is defined by the Swedish words *hamn* or *färd*.[3]

Vidi 1727 Lundini in altissimo, ubi nulla scala, pulsabat 3. extra parietem cameræ meæ; hora 3 matutina, expergefactus miror; redit iterum 3 ictus; terrefactus et tertia vice 3 ictus duros pulsat; moritur, tum sana, post aliquot hebdomas, mater Stobæi in proxima camera.[4]

Pater retulit se vidisse vespera, dum carbones adhuc ignitæ illuminabant cameram, introvisse quendam, linteo obvolutum, sedisse juxta focum, abivisse. altero (die) mane dum ancillæ œconomica curant, quærunt num pater exiverat mane in linteo, negat. credit se moriturum; altero die accedit saltator phtisicus, permanet ibi per aliquot hebdomades, moritur.[5]

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[1] *LN*-MSS, fol. 16^{v}.

[2] *ND*-MS 51–53. The more strict Latin version in *LN* is rendered here and in the following.

[3] *LN*-MSS. Under the heading *Idolatria* (fol. 10^{r}) is said: The double "is seen before somebody dies, walking in his shirt, banging the wall three times, twice or thrice and three".

[4] *LN*-MSS, fol. 16^{v}. The date should be 1728, when Linnæus lived with Prof. Kilian Stobæus in Lund. More details in *ND*, p. 66. (MS 51).

[5] Much abridged in *ND*, p. 57 (MS 53). In the paternal house of Linnaeus "French dancing master" Soberant was dead by 1724.

1742. accedens ad Socerum ægrum, ea nocte super me ambulatur, dum in lecto quiesco cum uxore; ambo audivimus; interrogamus quis ibi fuerit postero die, nullus dicitur, et socra clavem apud se habuit. 28 à 29 nocte novembris jacet æger in camera, uxor mea adsidet, non ea nocte mortem expectans patris; intrat cameram ubi affinis vigilans ambulat plena terroris; quærit uxor num pulsabat parietem, altera negat, sed se vidisse per fenestram linteum descendisse, inde terrefactam esse, introeunt ambo, reperiunt socrum meum in agone.[1]

Linnæus relates how he had the same type of experience in 1744 regarding the death of his infant daughter, Sara Magdalena, and also in other connections in later years.[2] Experiences of this type appear to have followed Linnæus throughout his life, and his disposition in this regard seems to have been a part of his own mental structure. One of Linnæus' students in later years tells that one day he followed his teacher up to his room and: "When we had arrived at his museum he looked at the table and chair where he usually sat when studying and said clearly in a high voice: 'Aha! Is it you sitting there Carl? Sit in peace, I will not disturb you.' I ventured to ask: Sir, whom are you addressing? I sometimes think that I am sitting there (he pointed to the chair) working, he replied."[3] However, whichever way one wishes to interpret such personal documents, they seem to reveal a particular constitutional trait in Linnæus' make-up. At this junction between faith and non-belief personal and popular conjectures unite in him: *quid hoc? an fabula? an aliquid quod sensus nostri non observant?*

Surprisingly enough *spectra* (ghosts) and *incubi* (nightmares) also appear in this connection.[4] To comprehend this, we must bear in mind that the clue to Linnæus' presentation is *animi pathemata*. He talks about *spectra*, the existence of which is difficult to decide.[5] Imagination, he says, gives rise to "panic-stricken fear and turns terror of darkness into an illness which impresses itself upon a child through habit and hinders it from venturing

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[1] *LN*-MSS, ibidem; also in *ND*, p. 66 (MS 53), where there is a note that two women had heard coffins being nailed, in *LN* referred to in passing as *vulgaria fata*.

[2] *LN*-MSS, ibidem and *ND*, MS 52 sq.

[3] In his footnote to the text *ND*, p. 64 Fries refers to this very remarkable story by Dean C. G. Rollin, published by himself in a paper, Stockholm 1857.

[4] *LN*-MSS, fol. $16^{r, v}$ and 10^{r}.

[5] In the original: *Spectra an dentur, res est plena difficultatum.*

out into the dark and crying at home. Someone who loses a person through violent death is petrified at nightfall and sees things which are non-existent. In former days spirits were considered godly things, and the credulous multitude create their own."[1] To this group of spirits Linnæus attributes *lares* and *penates* (the usual interpretation of the Swedish *tomtar*, *vättar*, hobgoblins and gnomes), mountain-trolls, fairies in the woods (named by Linnæus *skogsnuvor*), and water spirits (Swedish *näckar*), which, according to popular beliefs, could kidnap humans and cause their death. These supernatural beings are also listed under the heading: *Idolatry*, as *Neptunus*, *Nymphæ*, *Najades*, *Dryades*, *Satyri* and are apparently connected with classical mythology for no reason except that some of them behave in a demoniacally seducing and violating way.[2] This feature holds good especially for the erotic dream-beings in nightmares (*Ephialtes*). With regard to the nightmare Linnæus draws attention to some obviously direct observations from the life of the people. He says: "The nightmare affects the farm-hands. It tries to assault and almost suffocate them. The remedy is to throw themselves to one side, whilst the nightmare falls to the floor." Linnæus presumes that the reason for such a "strange illness" (*mirus morbus*) could have been flatulency.[3] Clearly he tries here as in many other instances, to explain popular misrepresentations in a rational way.

Linnæus has a similar explanation at hand when the question of the water-sprite, the *näck*, is brought up. The water-sprite is seen as a naked man in the water, but as a brindled horse on land. He takes hold of the swimmer's leg, pulls him under the water, and then sucks blood out of him. The cause of this is given as cramp in cold water (*spasmus ab aqua frigida*).[4]

About the female wood nymph, *skogsnuva*, Linnæus tells us: "She misleads one in the woods. If one cannot find the way home and is bewildered, one

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[1] *LN*-MSS, fol. 16[r].

[2] *LN*-MSS, fol. 16[r] and 10[r].

[3] In the original text *LN*-MSS 16[v]: *Oritur a musto, cerevisia recenti et omnibus flatulentis.*

[4] *LN*-MSS, fol. 16[r]. The story is told from Småland as also the accompanying charm of "binding the Neck". Cf. Samuel Ödmann, *Hågkomster*, Örebro 1864, pp. 55 sq.; K. Rob. V. Wikman, *Magiska bindebruk* in the journal *Hembygden*, Helsingfors 1912, pp. 67 sqq.; W. Liungman, *Sveriges sägner*, II, Örebro 1958, pp. 26 sqq.; 132 sq.

should turn one's jacket inside out, whereupon she goes away with a laugh." *Seducit in sylvis homines et a via ducit.*[1]

Undefined beings such as goblins (*tomtar*), and gnomes (*vättar*), in Roman interpretation *penates* and *lares*, are explained away as being figures of the imagination and sense-delusions. Linnæus is unreserved on this point: *Rustici credunt quod tales dentur, adportant et exportant bona. Falsa omnino sunt hæc nec visa umquam quod credo.*[2]

Concerning the prevalent folk-belief which maintained that gnomes and similar spirits could be heard hammering and chopping in a house which was under construction, even after the workmen had left,[3] Linnæus suggests that the causes for such fancies were the deathwatch-beetle.[4]

Under the heading of *Spectres* Linnæus lastly lists some kind of ghost-lights, probably St. Elmo's fires (*ignis lambens*), fetch-lights (*ignis fatuus*), and ghost-fires (Swedish *gasteld*).[5] He explains most of them as phenomena in the air.

About an *ignis fatuus* seen by himself and his brother-in-law he narrates the following peculiarity:

1726 vidi in lacu ubi submersæ anno præteriti duæ feminæ, ignem ac si candela lucisset supra undas, idque vero cum Pastore et marito sororis Höök.

However, at almost the same time, Linnæus and his teacher, Rothman, exposed another light as being the reflection of a stone bathed in moonlight. The doubt in the mind seems undeniable, otherwise Linnæus would never have reported this experience in *Lachesis*.[6]

By the conception *spectres* Linnæus refers to wicked spirits in popular beliefs, such as trolls, evil spirits, and the devil. According to the account of the Bible, he states, the mountain trolls are descended from Lucifer and his family. This is why the mountains raise themselves on four pillars on

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[1] *LN*-MSS, fol. 10^{r}, 16^{r}. Cf. about *skogsmuva* G. O. Hyltén-Cavallius, op. cit., I, pp. 277 sqq.

[2] *LN*-MSS, fol. 16^{r}.

[3] Ibidem. These views are obviously confused with tales about hobgoblins still hammering during the night when the workers on the building have gone home. Cf. G. O. Hyltén-Cavallius, op. cit., I, pp. 269 sq.

[4] *LN*-MSS, fol. 17^{v}.

[5] *LN*-MSS, fol. 17^{r}.

[6] *LN*-MSS, fol. 16^{r}.

Christmas Night. The Trolls kidnap people, who, if they do not eat or talk, are thrown out after three days. Such spirits exchange new-born babies; they take human children aud replace them with their own troll-children (*fatui*) who eat but do not talk. The people threaten to throw the young trolls into a hot oven and in this way cause the return of their own children.[1] "For those who are possessed by the Devil and suffer from demonomania, which is an *inflammatio cerebri*" Linnæus recommends a medical doctor and not a priest. Witches (Swedish *trollpackor*), "who ride to Blåkulla anoint themselves, are intimate with the Devil, force their way into churches, journey on clouds etc., were in the old days condemend to burn eternally." However, those who in delirium, accused each other, confessed and spoke in fear "would, in our own day, hardly be condemned in this way by any judge", says Linnæus. "As a Christian I refuse to comment upon the existence of the Devil or devils", he declares, but adds: "To believe that the Devil is Almighty and that he can influence different bodies etc., is to credit him with the gifts which adhere to God. The wise man shall not deny that which is true, nor shall he believe that which is false. Ignorance about nature can cause much harm. This is why common people see and hear so much. How could this possibly remain unknown to the natural scientist: *Ne credatis, nisi quod manus vestra occulta videre.*"[2]

On the 19th August, 1741, Linnæus and his companions visited the Court of Appeal at Jönköping in Northern Småland where they saw a large collection of witchery-instruments such as black-books, magic knots, a hornpipe which had been used to conjure forth spirits, and a rod which was used to milk another person's cow. Linnæus writes: "We blew on the magic hornpipe without devils appearing, and we also used the milking rod to no avail."[3] This amusing experiment is a token of the new era of the Enlightenment, when the belief in devils, witches and spells was becoming a thing of the past among educated people.

As a physician and naturalist Linnæus devoted himself mainly to the active expression of popular magic. We must bear in mind that, for him,

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[1] *LN*-MSS, fol. 16^{v}.
[2] *LN*-MSS, fol. 16^{v} and 17^{v}.
[3] *Öländska och gothländska resa* p. 330.

superstitious fiction is only a long list of indications of psychic abnormalities. He mentions *Nymphæ*, *Najades* and *Dryades* in connection with *Idolatry*, but presumably he has in mind the practices used by the country-people in order to placate supernatural powers in water-courses, lakes, holy wells and trees. Obviously these powers are not regarded as spectres. Only incidentally is the name of *Jupiter*, the Old Northern Thor, mentioned in connection with the prevalent notions about the widely spread prohibitions of spinning on Thursday evenings. It is also said that needles and coins are thrown into a sacrifical well to cure itching. If someone takes them out the illness is transferred to him. If someone chops down a holy tree he becomes sick and may even die. If twigs or leaves are removed, the picker gets ill and is obliged to return them, etc.[1]

Linnæus' Dietetic concludes in a plea for psychic health and healing. His concept of *animi pathemata* is in no way meant as psychiatry. The attitudes of mind include such subjects as have been mentioned in this chapter. A methodically elaborated system is lacking. However, some distinctions are very important, as when Linnæus distinguishes magic from popular superstitions and also superstition from stories of ghosts, spooks and apparitions (*spectra*, *manes*). His *magia* is science, even if it is an occult science. Contrariwise *superstitio* is the irrational way of popular thinking and acting, owing to prejudices or shortcomings of experience and theory. The only cure for this is a rational knowledge of nature. The problem is how to gain this knowledge, and how to make it known amongst the people. This seems to us a very simple question, but for Linnæus it became a "respectable argument" for the understanding of the reasoning and actions of the common people. To this end it was necessary to bring together "a considerable collection" of material in order not only to show their origin but also prevent the flourishing practices of healers and quacks. For this purpose Linnæus appealed to his extensive clientel of students and especially to the young theologians among his audience, and his appeal was not without success.

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[1] *LN*-MSS, fol. 10r. The supernatural beings of nature which are concerned are commonly expressed with Swedish *vård*, *rå* 'holding spirit'. Cf. *The Supernatural Owners of Nature*, ed. by Åke Hultkrantz (*Stockholm Studies in Comparative Religion* 1), Stockholm 1961.

These activities of Linnæus, who was then a young Professor of medicine at the University of Upsala, became generally known and had considerable influence. He had a fair harvest of memories from his youth in his native province to which he could add new items from his journeys. *Superstitiosa tota gens Smolandiæ*, he declares, and subsequently he chiefly enters this material in his lecture-notes.[1] But such notes may also have crept in from other sources. As mentioned above, medicinal and fictional folklore is to be found in other parts of the *Lachesis* manuscript. On several occasions Linnæus remarks that a superstition may have a sympathetic origin. This seems to be an intricate question, because it clearly shows that the distinction between learned magic and popular superstition is a highly ambiguous matter. What then is the difference? Neither rational experience nor the tentative doctrine of sympathies was enough to disperse popular beliefs. Linnæus sensed that one had to delve further into man's psychical depths in order to be able to explain these phenomena.

As a general basis for popular beliefs Linnæus considered in the first instance a child's fright of the dark. His description of the emotional background is very personal. He emphasizes the fact that children are so afraid of the dark that they simply dare not venture outside. "Common sense does not help here. I never dared to go out alone before I was twenty, and even now I shudder in certain rooms, although I know better."[2] Linnæus often returns to this subject and its importance for the educational system of his day. To understand him we must recollect, like the famous psychologist William James, that the ghostly terror is composed of several components, such as "loneliness, darkness, inexplicable sounds, especially of a dismal character, moving figures, half discerned (or if discernible, of dreadful aspect), and a vertiginous baffling of expectation."[3] Finally, according to James, the intellectual element enters into the context. With regard to Linnæus' own personal views we have to seek their background in a theme "filled with difficulties". The attempts at physical explanation in Linnæus' time served the purposes of the Enlightenment. Where the emotive attitudes of the mind were concerned, however, the shortcomings of such attempts

[1] *LN*-MSS.
[2] *LN*, p. 150.
[3] *Principles of Psychology*, I, 1910, p. 419.

were too apparent not to be discerned by Linnæus himself. The psychical basis of his reasoning, however, is discernible, though disguised by the actual wording.

In this connection a crucial point suggests itself in the concept *hamn*, which Linnæus renders with the Latin term *manes*. This concept refers not only to popular beliefs but also to Linnæus' own experiences. The popular beliefs concerning the destiny of man are closely connected with the old Scandinavian words: *ham*, *hamingja* and *fylgja*, the representations of which in the more modern Scandinavian languages are expressed by a great number of terms such as: Norwegian *ham*, Swedish *hamn*, Norwegian *vard*, *vord;* Swedish *vård* (cf. Swedish *varsel*); Norwegian *ferd* (*foreferd*), Swedish *färd*; Norwegian *fegda*, Swedish *fegd* (the old Scandinavian adjective *feigr* has its counterpart in all Germanic languages). The general folkloristic meaning of *hamn* can, in English, be rendered with the Gaelic word *wraith*.[1] However, the deep-lying interdependence of these concepts cannot be penetrated here. We can only refer to the recent account given by the prominent Norwegian folklorist Dr. Lily Aall, based on Norwegian materials.[2]

Psychologically these concepts have been debated very frequently. Dr. Aall has shown that not a single one of the existing general theories can be significantly applicable to this material. The reason for this is simply that any psychologically relevant theory miscarries. Only tentatively may we propose a description of these phenomena as psychic projections with a conspicuous tendency to dissociate and disintegrate, or, in accordance with one's personal structure and habits, to be conceived, even though vaguely, as activities or beings in the external world. Of course in this connection visual, auditive, and other sensory dispositions enter into the picture. The

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[1] John Brand, *Popular Antiquities*, London 1888, pp. 705 sq.; concerning *fylgia* Jan de Vries, *Altgermanische Religionsgeschichte*, I, 2. Aufl., Berlin 1956, p. 228: "nicht nur eine Projektion des inneren Wesens eines Menschen nach aussen sondern auch ein ausserhalb des Menschen für sich bestehendes Wesen".

[2] Lily Weiser-Aall, *En studie om vardøger, Norveg. Folkelivsgransking* 12, Oslo 1965, pp. 73–112 (with a summary in German).

border-line between the normal and the abnormal may be both uncertain and indefinite.

Linnæus' aim with his Dietetic was not to provide us with data for such conclusions. His arguments, however, would appear to be of some importance when here, and in what follows, our aim will be to try to obtain an overall picture of Linnæus' way of thinking and of his personality.

III. Divine Retaliation

I

Ever since the day in 1844 when the loose leaves written by Carl Linnæus under the heading *Nemesis Divina* were recovered and entrusted to the care of Upsala University Library, they have continued to cause surprise and interest. And the small volume, subsequently bound, with its 203 octavo leaves, still preserves much of its attraction as a treasury of the innermost thoughts of the great naturalist.

It is known that Linnæus wrote these pages in the course of a long period of time and kept them strictly secret. When he dedicated them to his son, the younger Linnæus, he added: "Perhaps many stories are incorrectly told. Listen carefully; say nothing, do not injure anybody's name or honour." This admonition has been reverently heeded up to our own day. Until now no complete edition of the manuscript, existed, only a selection, in itself commendable, published and annotated by Elias and Thore Magnus Fries under the title *Carl von Linnés anteckningar öfver Nemesis Divina* ('Carl Linnæus' notes concerning Nemesis Divina'). The selection first appeared on the occasion of the doctoral investiture in Upsala in 1848. A second, enlarged and revised edition was published in 1878.

Unfortunately it has been impossible to arrange the originally loose Nemesis papers into a form which would allow us to form a clear idea of their origin and their real connection with Linnæus' biography. Only in isolated cases are we able to establish the *terminus post quem*. We must, however, assume that Linnæus' views and outlook developed and changed in the course of time, and that the differences between his early years, his maturity and his old age have left their traces. As far as we know, Linnæus began to display signs of senility comparatively early on; at least in the 1760s. The major part of *Nemesis Divina*, the title page, and the dedication to the younger Linnæus, appear to have been written during this period.[1]

[1] Arvid Hj. Uggla treats of the origins of the *ND*-MSS. *SLSÅ* 1967, p. 13–19; see further the new complete edition, Stockholm 1968, pp. 16 sqq. [Author's note in the proof.]

Linnæus' *Nemesis Divina* has been the subject of many different interpretations which, in themselves, will not be discussed here. Our main concern will be the central problem of the notes: the belief in fate and the concept of retaliation. But these are in their turn dependent on Linnæus' conception of Nature and God, and, not least, on his views concerning the unity and continuity of the natural and the moral world order. Whatever the sources of his religious ideas, and whatever changes they may have undergone, Linnæus' religious attitude to the workings of nature remained unaltered. But Linnæus' religion such as we know it from his writings, particularly in his earlier years, was undogmatic, un-theological and more or less heterodox from the point of view of the Church. This may have been partly due to his general outlook, his manner of viewing things in accordance with the inner necessity of the processes of nature and character of divine justice. To Linnæus crime and punishment stood out as a necessary unit, which finds its expression in the judgement of divine fate; this is the *nemesis* doctrine *in nuce*. The appeal is never to punishments or rewards in a future existence. For Linnæus 'experience' was the decisive criterion: "If you do not believe because of S.S. (*Scriptura Sacra*), then believe in it because of Experience", he wrote in the versified dedication to "My only son" which follows after the title page of *Nemesis Divina*.[1]

Linnæus' approach is that of a *Theologia experimentalis*. He collects cases which he regards as divine retaliation in this life. In retaliation he traces the old judicial principle that the criminal act has to be answered in the same way as it had been committed. In retaliation he also recognizes the combination of the inexorable law of Nature with God's own justice. *Nemesis Divina* thus becomes *Jus Talionis*.

In what follows I shall try to show, with a few typical examples, how Linnæus applies his outlook to his material. Let us begin with two cases culled from people in his home district. First, Måns in Sannaböke, in the parish of Stenbrohult in Småland.

"This happened during my childhood in my birthplace", says Linnæus. Måns was "a callous man, cruel to his father. Måns Månsson, the son, pulled his father by

[1] *ND*, p. 3 (MS 2).

the hair, and tried to drag him out of his cottage. When the father reached the door, he cried: 'Masse, don't drag me any further; I did not drag my father any further.' The son answered: 'Yes, by the death of Our Lord, if you dragged your father to the door, I shall drag you outside it.' "[1]

Another annotation from Stenbrohult tells about Jacob in Såanäs, "who was on bad terms with his wife".

"During the Christmas holiday (in my youth) when she was walking over the ice to Church, she fell through and, crying for help, she clung on to the edge of the ice for a long time, around a quarter of an hour. The husband who was standing on the bank, as it happened near the farm, said that he dare not walk on the ice, and furthermore he would be happy to be rid of her; she drowned. Five years later Jacob's fingers, with which he could have rescued his wife, began to rot away on both hands which subsequently caused his death."[2]

It is natural that such stories should embody traditional expressions of the general indignation felt against the perpetrator of gross crimes committed against the Fourth and Fifth Commandments. But the stories are also traditional variants of such motifs as tend to be drastically or cruelly quoted for retaliatory purposes.

But Linnæus also gathers his observations from an older, more historic setting: this is the case with Charles XI and the story of Carl Piper and Jacob Boëthius. Of the former it is said:

"King Carl made a great many Noblemen homeless through the 'reduction' (his confiscation of castles and estates). When he was dead, the Royal Castle in Stockholm caught fire, and his body could only be rescued with a great deal of difficulty".[3]

It is well known that Charles XI's severe reduction of the fiefs of the nobility for a long time afterwards made the King's memory hateful to the social classes most affected by it. That the episode of the Castle fire in 1697 was included in the *Nemesis* material, may however, rather be ascribed to pity for defenceless and innocently suffering people. Direct comparisons suggest themselves among these notes. Of Dean Boëthius in Mora it is told that for political reasons he was arraigned by Carl Piper, the favourite of Charles XII, and that he was imprisoned for life in the fortress of Nöteborg.

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[1] *ND*, p. 51 (MS 118). [2] *ND*, pp. 50 sq. (MS 92).
[3] *ND*, p. 44 (MS 192).

"The Russians conquered Nöteborg and were victorious at Pultava, where they captured Piper, released Boëthius from prison and sent him home to Sweden, and put Piper in the same prison where he perished wretchedly".[1]

The subjective explanation of Linnæus' choice of these examples is to be found in his reaction against the severe judgements of the absolute monarchy. Otherwise it is difficult to believe that the vengeful sentiments reflected in a given circle of people, with which Linnæus probably had been in contact, could bring about much more than a fictitious relation between crime and punishment.

The following case is also probably based on hearsay.

"Slichert, a yeoman of the Royal Guard, loved a widow von Byzen and gave her an estate. The brother-in-law resented this and one night he fired three shots through the window of the house. The bullets went straight into Slichert's stomach. Several years later the brother-in-law developed cancer in the stomach with three holes, which caused him a gruesome death."[2]

The principle of similarity is, in the case of Slichert, developed in great detail, so that the punishment becomes a clear reflection of the crime. Such cases are not very frequent, but when they occur, the reader cannot but assume that they are based on hearsay and contain very little truth. In other cases the critical reader is compelled to assume that Linnæus deliberately looked for examples of this kind of notion. His inductive method thus becomes more apparent than real.

The case, however, is different in those cases which Linnæus came across in his contemporary environment. Here we encounter a long and variegated gallery of intriguers, receivers of bribes, swindlers and rascals in public service. The narrowly bourgeois and academic circles contribute numerous cases of greed, grudge, perfidy, loose living, quarrelling and favouritism. Linnæus describes his cases in such a frank and realistic manner that the retaliation sometimes sounds like an echo of *vox vulgi*.

It is said that the Upsala Alderman, Kyronius' crimes provoked a public cry, "Crucify". He had to leave everything he had "like a sparrow from the ears of corn,"[3] but escaped justice by fleeing the country. The Penal Code

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[1] *ND*, p. 31 (MS 126).
[2] *ND*, p. 53 (MS 66).
[3] *ND*, pp. 37 sq. (MS 185).

of Nemesis, however, is seldom so indulgent. In most cases retaliation inflicts itself in the form of illness, misfortune and poverty.

The case of Herkepæus is connected with Kyronius above mentioned. Herkepæus was Mayor of Upsala, and was accused by Kyronius of having made derogatory statements concerning the Four Estates of the Realm. He reminded his judge of the fact that he had once carried the latter's father out of a burning house, but in spite of this he received a severe sentence. Ten years later the judge's own family estate was burnt to ashes.[1]

The cases of ruthlessness and inhumanity are numerous. Greed, ill-gotten goods, or advantages acquired at another person's expense, informing, unjust accusations are in the same way subject to retaliation in the most summary fashion. Typical of the period is the notion that informing is revenged by informing. Moreover, when the denounced person takes his own life, it may so happen that the informer follows suit.[2]

The widowed second wife of the Upsala Professor Nils Wallerius is said to have been "extremely cruel to her step-children, servants, husband and children". When her husband died she parted from them under several pretexts. She lost the house through fire in 1766, the cowhouse in September and in the December of the same year the vicarage to which she had moved; "she and her son barely managed to escape in their nightgowns". "Do not be cruel and ruthless. There is no grace for him who has no charity", adds Linnæus.[3]

Renhorn and Rogberg, who appeared as prosecutors and judges in the Brahe trial in 1756, lost their health and died some time afterwards from "alteration".[4] All the judges of the Goertz trial in 1720 meet with misfortune, and "the merriest of all dies of melancholy".[5]

Sometimes we sense a hint of *Humor im Recht* in Linnæus; as in the example of the merry judge, or when the two quarrelsome sisters Friesendorff of Hammarby finally have to share the same grave.[6]

In contrast with these cases is the *homicide* group (Swedish: *mord* and

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[1] *ND*, p. 35 (MS 190).
[2] *ND*, p. 31 (MS 125).
[3] *ND*, p. 46 (MS 85).
[4] *ND*, pp. 29 sq. (MS 112, 115).
[5] *ND*, pp. 34 sq. (MS 148).
[6] *ND*, p. 52 (MS 142).

dråp). Here the retaliation punishments predominate completely. In certain cases the retaliation reflects the detailed circumstances of the crime itself. The notorious and disastrous murder of Major Malcolm Sinclair in 1739 was regarded by Linnæus as a divine retaliation for a similar crime committed by Sinclair who, during his captivity in Russia, had stabbed to death a Warrant Officer called Lod. However, in due time the instigator of the Sinclair murder and his accomplice were also hit by the divine vengeance.[1] Another *Nemesis* story is about a young Count Cronhielm, who meets a peasant on the ice, runs into the latter's sledge, and in his anger beats the peasant to death. Some years later the Count goes through the ice in a rift at the same place. He cries: "I see God's vengeance in this place", and drowns.[2] The most consistent retaliation is to be found in the case of Slichert referred to above. In such cases we find ourselves in the classical domaine of the *lex talionis*.

The notion that the divine vengeance can fall upon the descendants of the guilty, and that it can be brought about by another person than the wronged one, is closely related to the primitive belief in retaliation. Linnæus gives us several examples showing that no good will come of possessions acquired through ruthlessness against one's fellow men and meanness towards one's own self: such goods will not even outlast the next generation. The following typical example may provide an illustration:

"Sohlberg, a mining inspector in Falun, rich, fleeces the poor miners almost down to their bare bones and in this way he has amassed his fortune. He has five quick-witted sons, but none of them an economist. All poor and in debt. *De male quæsitis non gaudebit tertius heres.*"[3]

The same moral is expressed by an old Swedish proverb: "Ill-gotten goods are not inherited by the third generation." This is to all appearances a purely social maxim based on experience. It is, however, probable that Linnæus regarded the act itself as the retaliation of a moral guilt. The following case is illuminating in this respect:

"Olof Håkansson, a farmer from Blekinge, Speaker at all the Parliamentary sessions, except one, from 1739 to 1770. Amassed an unbelievable fortune, many barrels of

[1] *ND*, p. 55 (MS 161). Cf. pp. 43, 54 (MS 102).
[2] *ND*, pp. 33 sq. (MS 162).
[3] *ND*, p. 45 (MS 67).

gold, took bribes; the wealthiest farmer living in Sweden, died in Parliament in 1769. Six months later in February 1770 his youngest son died, and then his daughter also of a ravaging fever. The son in Stockholm does not appear to be strong..."[1]

Linnæus identifies the system of Nature with the moral system of the world, and equates physical and moral affliction. "The sons of great men become incompetent" (*heroum filii noxæ*), is often quoted by Linnæus. "The unhappy are born to unhappy parents."[2]

When retaliation thus becomes purely numinous, the retaliatory principle naturally looses its judicial meaning. This applies to the retaliation in many uncertain cases. When punishing abuses of the word of God, or breaches of oaths and promises, the retaliation is according to the Law of Moses. The case of Daniel Solander, Professor of Law, may be regarded as highly representative of Linnæus' views.

"Solander had been engaged to the daughter of Professor Hermansson, on whose recommendation he had been given his position. After his appointment in 1740, however, he married the wealthy widow of a chemist. In the course of the years she took to drink, squandered her fortune, and ruined the lives of husband and children."[3]

In the case of sexual delinquents it is often the physician in Linnæus that prevails. His attitude is pronounced only in connection with breach of faith in love and marriage.[4] As for offences against property rights, Linnæus appears chiefly concerned with crimes causing permanent and irreparable damage to private or public welfare.[5] Such divergences from more rigorous conceptions are worth noting,[6] and they may also reflect a contemporary shift of opinion in legal matters.

The moral and judicial conceptions expressed in the majority of cases have a typically individualistic stamp. The *talio* rule applies to the culprit's descendants chiefly in such cases where hereditary and social circumstances are presumed to stand in a causal connection which is hidden to the world. The social structure and the development of the sense of justice stood in the

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[1] *ND*, p. 35 (MS 169).
[2] *ND*, p. 20 (MS 28).
[3] *ND*, p. 61 (MS 71).
[4] *ND*, pp. 59 sqq.
[5] *ND*, p. 23.
[6] Similar views already expressed in *DN*.

way of belief in a retaliation of a more far-reaching character. In this respect there is a marked difference between *Nemesis Divina* and a doctrine of retaliation which regarded punishment *sub specie aeternitatis*, and consequently tried to apply it in maximal forms even in this world. Temporal and eternal death are never identified by Linnæus. His *Nemesis* has no field of action outside our temporal existence. But nevertheless his doctrine of retaliation has an immanent function in social and historical events.

According to Linnæus no one can create his own happiness, although he can contribute to his own misfortunes. Only the Devil can blazon abroad that everybody is the maker of his own fortune since in that case he would be his own maker (*causa suæ existentiæ*). Linnæus' views are in keeping with his Stoicism. But at the same time they tie up with the Theodicy problem of the period. The great earthquake in Lisbon on All Saints' Day, 1st November, 1755, had roused the educated classes of Europe out of the illusion of "the best of all possible worlds". Even Voltaire began to entertain pessimistic doubts that things were perhaps not so good after all.[1] This terrible catastrophe provoked Linnæus to a meditation on the "wickedness" of the world. Lisbon was ravaged by "earthquake, floods, accidental fire and all the cruel punishments imposed by God on obdurate sinners; half the earth quaked, and by this He revealed that He could hear, and have mercy upon the unfortunate even if they were heretics." Linnæus refers here to the stakes of the Catholic Inquisition which were lit in Lisbon on All Saints' Day.[2] Like Voltaire, Linnæus aims at *L'infâme*, the Catholic Church. But while the former makes allowance for the future, Linnæus' pessimism is radical in its anchorage in retaliation by fate. Linnæus' diatribe against Catholicism in the *Nemesis* deserves to be mentioned in this connection because it appears to be directed mainly at the abuses of religious faith. This is shown by an appropriate example about the mine of Norberg in Dalecarlia, which was flooded because all work had to cease during a Religious Holiday.[3]

The *Nemesis* doctrine cannot claim to be a revealed faith. It claims to be based on experience, and this is conditioned by the contemporary social

[1] Cf. Ernst Cassirer, *Die Philosophie der Aufklärung*, pp. 196 sq.
[2] *ND*, p. 13 (MS 56).
[3] *ND*, pp. 16 sq. (MS 4, 9).

situation. The social sanction is salient in such cases where crimes accumulate; a case in point being the story of Kyronius. Misfortunes never come alone, Linnæus says with a proverbial expression. Public opinion pushes the chariot of the divine vengeance: *vox populi, vox dei.* Retaliation thus appeals to the desire to "crucify" of popular justice. Duelling as a form of private vengeance is not morally sanctioned by Linnæus. Not only does the duel fall outside Linnæus' code of honour; it is also contrary to his religious outlook. "Everyone wants to be God, everyone wants to pass capital sentence on his neighbour by sword or pistol. Alas, poor fool, your time is nevertheless running out." Here the motive is not, any more than in the other cases, taken into account. No guilt is attached to the one who is slain. The killer is punished afterwards, after the act has been committed.

When Linnæus introduces historical persons and events into the *Nemesis* notes, it would seem as if he had ultimately wished to give the judgements of fate a place in the pages of history. This is the impression one gets when he classifies the Roman emperors according to their political actions and length of life. Linnæus may indeed have aimed at something in the way of a philosophy of history. But this, of course, could never be more than an experiment with uncertain facts, which he was unable to bring into a pragmatic order. His methods were inadequate for such tasks. There is nonetheless a curious and interesting trend of thought in his reasoning of retributive fate, a trend which nowadays may perhaps be recognized in Spengler and Toynbee.

The concept of fate is to be found already in the later parts of *Diæta naturalis:*

> *Comœdiam ludunt Clotho, Lachesis, Atropos.*
> *Fortuna comœdiam agit.*[1]

We come across *Lachesis* for the first time here in a Linnean context. This was to be the symbolic title of Linnæus' Dietetic. We also read here the following invocation to Omnipotent Fate. The English translation can only give an imperfect idea of the Swedish original.

O Fate, cruel tyranny. Have you alone received power over all that God has created to His own praise; are you to be allowed to make His entire masterpiece of no avail, you alone to make confusion in the whole world?

You take away the old and wise, and leave the young and imprudent. You put out the sparkling eyes of this world and you spare the blear-eyed. You throw away the rich who have built themselves up, you do not hear the cries of the poor.

You take away the work from the one who builds before it is finished.

When we have toiled for a long time in misery, and begin to find rest from our toil, you take the opportunity to end the pleasure before it starts.

The misery of the poor does not move you, nor is the power of the mighty spared.

No intellect can escape you and no quality avoid you.

No place in the world is safe from you.[2]

The concept of fate recurs again in the Prolegomena of *Lachesis naturalis.* But there it is no longer contrasted with the concept of God as earlier. The two views are separated in time.[3] In the Lachesis it is no longer a question of *fatum* but of *fata.* It is stated there that the fates are the "hands of God," and "follow their own irrevocable course"; "they happen just as it has once been decided".[4]

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[1] *DN*, pp. 202 sq.
[2] *DN*, p. 204.
[3] The introductory part of *Lachesis* verisimilarly dates from the 1760's.
[4] *LN*, pp. 9 sq

In my opinion we are in this case dealing with the opposite concepts of 'ειμαρμένη ("the necessary course of events") and ("one's lot in life", often in the plural, *fata*), in the last resort determined by the Deity himself. In the present case a difference between Linnæus' earlier and later views is thus accentuated.

In *Lachesis* it is difficult to find any attempt to reconcile the concept of fate with the question of the freedom of human actions. Nature is said to "force the will" (*cogit velle*),[1] but the context shows that Linnæus wishes to say that this happens through desires, pains, emotions and sensations of hunger. The passage deals with physical expression only, and thus lacks metaphysical significance. In *Nemesis* on the other hand, Linnæus considers the moral aspect, and indicates his attitude by saying that any man can hang himself, drown himself, or cut his throat; he is also free to choose not to do so. But if, for some reason, he is sentenced to death by the Highest Judge, he is not free to escape from his sentence, but his death follows inevitably.[2] Thus, man is free to commit a crime or to decline, but once the crime is committed, he cannot escape his punishment. The problem of free will is thus only apparently eliminated in this highly sophistical argumentation.

When attempting to resolve the old problem of the "philosophers", Linnæus is thus unable to overcome the indecision between determinism and indeterminism, which was characteristic of the intellectual milieu of that time. His deterministic outlook leads him to a formalistic view on the "justice of nature", which, according to a strict principle of *Talion*, takes into account the act only, and not its motive. If one disregards the fact that God, according to Linnæus, acts as Nature's retaliating agent, this doctrine of punishment outwardly resembles Kant's moral theory. The eighteenth century moral philosophers often tended to equate the order of Nature and the moral world order. On the one hand they emphasize the Stoic conceptions of duty, and on the other, they tend to let the order of Nature and the moral world order merge into irrationalism. Both these features are to be found in Linnæus' conception of Divine Retaliation.

Already in the *Diæta naturalis* we find suggestions of the *Nemesis* concept. Man sins against God through ingratitude towards him, through indiffer-

[1] *LN*, p. 21.
[2] *ND*, p. 21 (MS 14).

ence (*securitas*) to the punishment which threatens. Man harms his neighbour through malice (*malitiositas*), ruthlessness and partiality (*suppressio*). The peasantry and subordinates are reduced to poverty; of which "so many become destitute, which causes no concern although half the multitude starve to death". We observe that the young Linnæus is intensely indignant towards ruthlessness, encroachment, and injustices committed against subordinates and the poor. Justice occupies the central position in his ethics. We have duties towards God, towards our neighbour and towards ourselves (*in Deum, proximum, in se ipsum*), and we are punished in this life if we infringe upon them. "God is a just judge." "I can never believe that so just a God spares the sinners." *Tandem justa causa triumphat.*[1]

This strong sense of social justice is repeated in almost the same words in *Nemesis Divina*. From the passage on poverty we quote the following remarks: "Think of the poor slave, who works for you while you sleep. He plows the field, and you reap. You say: this is my estate, I can do as I please. I say: nothing is yours; God has lent you everything."[2] In the same way it is said of wealth: "All we have is borrowed from God. We bring nothing with us; nor do we take anything away. When God and Fate, which is God's executor, take it away, we grieve for having lost what belongs to us; this has not been ours, it has only been a loan." One should be careful not to commit injustices against the powerful and poor; weapons are left with those who have been plundered. "They call upon God."[3] A great many cases of ruthlessness and inhuman dealings are included in the *Nemesis* collection.

Nemesis Divina may, with some dramatization, be called a funeral offering on the altar of Linnæus' sense of justice occasioned by the blood-guilt of the executions in Stockholm on 23rd July, 1756, the day when the participants in Queen Louisa Ulrica's abortive *coup d'état* met with a horrible death. In the *Lachesis* notes probably dating from later years, Linnæus mentions this harrowing experience:

"I saw no one as cruel as a human being, and shuddered at the thought of Stockholm's Butcher's Bench."

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[1] *DN*, pp. 193 sq.
[2] *DN*, p. 195.
[3] *ND*, p. 10 (MS 45).

"I saw miserable death surprise the most powerful, wisest, bravest, thus is this a most horrible world, a *laniena* and *rapina crudelis*."[1]

In *Nemesis* these events are referred to in general terms. The retaliation does not only befall the guilty but also their judges.[2] To these annotations Linnæus also adds accounts of earlier bloody sentences; among other the execution of the Generals Buddenbrock and Lewenhaupt after the Russian-Swedish war 1741–1742.[3]

On the back of the title page of *Nemesis* there is a quotation by the old Roman poet Claudianus:

> *Sæpe mihi dubiam traxit sententia mentem,*
> *Curarent Superi terras: an ullus inesset*
> *Rector aut incerto fluerent mortalia casu?*
> *Abstulit hunc tandem Rufini poena tumultum,*
> *Absolvitque Deos.*[4]

One cannot help thinking that when Linnæus quoted the verses on the fate of the East Roman Statesman, he had in mind Count Erik Brahe who had been executed in 1756. But at the same time the words suggest a religious resignation to divine retaliation. Something similar is to be found in the notes on the Brahe case.

In a communication to Svenska Linnésällskapet in Uppsala in 1940 Dr. Arvid Hj. Uggla emphasized that these *Nemesis* notes are datable to the 1760s. Linnæus' reflections on the retaliating justice laid down by Providence in Nature's own legislation, assumed a specific direction and a definite character after the afore-said historical events. There is no denying that *Nemesis Divina* forms, to a great extent, Linnæus' personal way of squaring accounts with the private and public morals in the so-called Period of Liberty. Linnæus' attitudes were like those of many of his contemporaries, principally determined by a morality which ties the individual to his own deed.

The concept of *Nemesis* in every case appears to have attained its main shape in the 1760s. It was also probably during this period that Linnæus

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[1] *LN*-MSS, fol. 21.
[2] *ND*, p. 31 (MS 122).
[3] *ND*, p. 31 sq. (MS 127). Cf. p. 29 (MS 110 sq).
[4] *ND*, p. 18 (Ms 1)

committed to paper the majority of annotations on *Nemesis Divina*. In any case by this time the *Nemesis* doctrine received distinct elements of the *Talion* of Moral theology. It is scarcely a coincidence that the title page of the notes was designed at the same time as there appeared in a Swedish translation in 1763 a treatise by the Dane, J. C. Friess, called *Den gudomliga vedergällningsrätten* ('The Divine Justice of Retaliation'). This is also shown in the definition under the title *Talio est æqualis retributio, unde reciproca talio, Autopathia Graecis.* The definition comes straight from Friess, who in his turn, had borrowed it from P. Ravenel's *Bibliotheca Sacra* which was published in Geneva in 1600. On the back of Linnæus' title leaf there is a direct reference to Friess, where it is briefly stated that Linnæus had "a little from this". On closer inspection this proves to consist of some ten annotations.

Among these there is a Rabbinical legend, which Linnæus quotes both in *Lachesis* and *Nemesis*.[1] The legend tells us how Our Lord showed Moses on Mount Sinai, how the Divine Retaliation demands a life for a life, uses the culprit as an instrument, and rewards the innocent sufferer. There is no doubt that this story tallies with Linnæus' outlook. But it is far from certain how far the influence of moral theology prompted Linnæus' ideas of retaliation in the direction of Old Testament justice. It is more likely that Linnæus' idea of retaliating justice had already begun to take shape in his home milieu during his early years.

At the beginning of the eighteenth century the general view on legal matters had not undergone any important changes since the preceding century, during which the Calvinist inspired penal principles of Charles IX had been accepted as a guide for the judicial system. All crimes regarded as violations of the Law of The Lord were to be dealt with according to the Old Jewish Penal Code. Capital punishment was therefore applied to the widest possible extent. Most forms of serious crimes, such as homicide, incest, blasphemy, ingratitude to parents, damage to the welfare of another person, and injuries to helpless creatures, are enumerated in the *Nemesis* list of objects of divine retaliation.

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[1] *ND*, pp. 22 sq. (MS 27), *LN*-MSS, fol. 8r. Cf. Louis Ginzberg, *The Legends of the Jews*, III, 4 impr., Philadelphia 1954, pp. 135 sq.

Linnæus does not, however, choose Biblical examples, but collects cases which he regards as representative of experience. The Canonical books and the Apocrypha of the Old Testament are, in the same way as the writings of the Roman Stoics, quoted in order to convey proverbial truths. The Proverbs of Solomon, the pessimism of the Ecclesiastes, and the wise words of Ecclesiasticus was part of the cultural heritage and the popular tradition of the period. But Linnæus' *Nemesis* doctrine is principally based on different foundations. The material consists of a collection of experiences, stories, reminiscences and products of his reading, but the theoretical aspects applied to these alleged facts are, in many respects, those of Linnæus' own time. It should be kept in mind that the concordance of Biblical and Stoical quotations also is an outcome of comparative tendencies; a fact from which, of course, very few historical conclusions can be drawn.

Seen objectively the conception of the penal application of retaliating justice was considered important during the middle of the eighteenth century. In this respect there is an obvious difference between the seventeenth century confusion of the Divine and the Civil Penal Code, and the eighteenth century's advance towards a more secularized jurisdiction, which Linnæus could not ignore. The humanization of Swedish Law had commenced at the end of the seventeenth century. But it progressed slowly, and the definite impact was not felt until the reign of Gustavus III. But Linnæus' sense of justice reacted, as we have seen, against acts of ruthlessness, cruelty and violence. His sympathy with poverty, destitution and abandonment is movingly expressed in *Nemesis Divina*. His own administration of justice while Rector of Upsala University proves his humane views on law and justice. The author of *Nemesis* does not revert to the Old Testament Retaliation which was during Charles IX's reign: "a soul for a soul, an eye for an eye, a tooth for a tooth, a hand for a hand, a foot for a foot". Retaliating justice is administered according to the severe laws of nature itself. But for Linnæus God is an enlightened ruler. This tendency was not unfamiliar to a period when Frederick II of Prussia's sister was the Queen of Sweden, and Gustavus III was heir to the throne. *Nemesis Divina* displays, as we have seen, many signs of the gradual modification of the concept of retaliation.

On the other hand, we should not forget that Linnæus was influenced by a neo-Hippocratic conception of human life. Even the later part of *Diæta*

naturalis contains a passage on a moral *diæta divina*, which, with reference to the teachings of the Bible and the Stoics, gives expression to those same rules of life which we find exemplified on many later occasions.[1] The very headings indicate the outlines of this doctrine: tranquillity, freedom from dejection and anxiety, envy, greed, voracity, violation and fornication. The general maxim proposed by Linnæus is: to live a blameless life (*innocentia vitæ*). We have here, then, purely Stoical virtues in a christianized paraphrase, and they all find expression in the *Nemesis Divina*.

The retributive justice of the *Nemesis* punishes such acts of commission and omission that have escaped punishment, or else been committed in secret. The Law of *Nemesis* is the Decalogue of *Exodus* (20: 3, 5–8, 12–17), but Linnæus gives the Ten Commandments his own rather deistically coloured formulation:

1. Through Nature and experience be convinced that there is a God.
2. Never make God witness an unrighteous deed.
3. Regard God's aims of Creation.
4. Do not be ungrateful.
5. Be careful of manslaughter.
6. Do not shame the women-folk and do not steal the men's hearts.
7. Do not accept any gain which has been made by foul means.
8. Be honest.
9. Do not conspire to overthrow others.
10. Do not intrigue for thine own advantage.[2]

At some points the Commandments have been rendered with great freedom, and at others the deviations from the Canonical text show traces of Linnæus' own convictions. The wording also differs from the text of the Bible in its partly positive, and partly generalized form. The Divine Law of Linnæus only considers the complete act, and thus gives expression principally to a secularized justice in accordance with the law of Nature. Its numinous character is, however, disguised in the form of a divine fate.

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[1] *DN*, pp. 197 sq.

[2] *ND*, pp. 8 sq. (MS 58); on a rewritten leaf of *Nemesis Divina* the "Law" appears in a latinized version: 1. *agnoscas Deum universi;* 2. *non contemnes contumeliosa;* 3. *videas Te factum in ejus gloriam;* 4. *gratus esto erga beneficia;* 5. *non noceas ulli;* 6. *non habeas polygama;* 7. *non capias alterius, sinas suum cuique;* 8. *non testem vocas cæcum Deum;* 9. *non sub prætextu aliena vindices. SLSÅ* XXXIX, p. 63.

The primary sources of the *Nemesis Divina* are partly unknown to us. But it is possible to form some idea of the religious emanation of the sources. Linnæus never tired of repeating: *Numen adest.* "Nemesis sees and hears everything. Let us tread carefully and not roughhew our way through the world",[1] lest fate should hear us. Fate watches and listens, and demands of us moderation and discretion in words and manners. Words and wishes are uttered, promises and oaths are given, and like blasphemies and curses they may fall back on their originators with the whole weight of the power of the words. Envy, oaths and heedless words are regarded as magically working forces: all according to the magic law of retaliation. In this way popular belief, too, regards human behaviour; the difference is scarcely more than the breadth of a hand, yet it is worth noticing.

According to the *Nemesis* anxiety is, as such, fated, independent of sin and guilt. "Fear comes before danger", is an old proverb. Linnæus writes: "Charles XII believed that every bullet had its billet, went between them like hail. Whilst other frightened ones fell."[2] Linnæus also tells us about a cuckoo which he saw in Orsa in 1734; the bird "shook and felt sick" before it was shot. He says that those who worry when they go to war or lie sick in bed hardly escape alive.[3] Both in the *Nemesis* and the *Lachesis* there is the story of Petrus Löfling[4] who stumbled whilst he was saying his farewells before the journey which ended so tragically in Guiana in 1756. A similar thing happened to Peter Forskåhl, who met his fate in Arabia in 1763. At this point Linnæus notes Ovid, and also mentions a current phrase of his own time: "His farewell shot misfired, he will not return."[5] A person who does not fear infection, remains uninfected. Fear is both a sign of fate and a natural cause; this idea is highly typical of Linnæus. He also emphasizes that committed crimes can never escape *Nemesis* in the future. Fate is divinatory; it makes itself known through omens and dreams. The sympathetic connection between crime and punishment, which is implied in the *Nemesis* belief, may become prognosticative as a sign of cause and effect. In this mysticism

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[1] *ND*, p. 12 (MS 42).
[2] *LN*-MSS, fol. 8[r].
[3] *LN*-MSS, fol. 8[v].
[4] *ND*, p. 68 (MS 48); *LN*-MSS, fol. 8[v].
[5] *LN*-MSS, fol. 8[r].

of fate magical and religious elements merge. One thing should, however, be borne in mind: Linnæus' conception of the phenomena, with which he dealt, falls within his explanation of nature, regardless of whether it is interpreted as natural religion or natural magic. For this reason the art of divination outside these boundaries does not appeal to him. He dismisses the art of divination and "planet reading" by asking sceptically whether that sort of thing can be of any value.[1] But he does not say, like Horace: *nefas est.*

The retaliatory indignation against the criminal brings together justice and religion. From the religious point of view the sinner is punished by the act of sinning, and the crime revenges itself. When the crime is regarded as sin and guilt, human misfortunes are often seen as divine punishments. Crime and punishment are linked together in this way in a sympathetic union. The retaliation is regarded as a force which, operating of necessity, is released in certain situations. The retaliation becomes an avenger of fate, which comes into operation according to religio-magical or juridical-moral principles which may co-operate or work against each other. Sin and crime are frequently identified as guilt, and regarded as the material cause of the punishment.

No real equivalence can reasonably exist between them. The retaliation often becomes a legal fiction, *Nemesis* only a fictitious Dike. The restrictive rules of the *Talion* become obscured by the numinous belief in fate. The sympathetic connection between crime and punishment is regarded as a symbolic similarity, and in the last resort becomes fictitious. Neither human nor divine justice can work without norms. It is this feature which makes the border-line between *jus naturæ* and *jus divinum* so extremely arbitrary.

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[3] *LN*-MSS, fol. 8.

Linnæus' personal attitude is coloured by the virtues of Stoic ethics, honesty, duty, and justice. These ideals determine the notion that infringements of the moral laws are avenged in this life by the Divine Order of Nature. "Fear of God, diligence, orderliness, virtuousness, helpfulness and that Emperor's Crown: honesty," are the qualities which Linnæus praises in his late friend, Andreas Neander.[1] There is no mention of rewards and punishments in a future life. The positive components of this ethical ideal culminate in the honesty of *l'homme honnête*, who is true to himself, *constans*, ὁμολογούμενος. This was the Stoic life-ideal as formulated in the seventeenth century by Justus Lipsius, du Vair, and, a little later, by Descartes.[2] This was something which Linnæus could hardly avoid coming into contact with during his period in Holland in the 1730s. The individualism of this conception of life is obvious, and with some modification one may call this Stoicism, as did Descartes, a moral for melancholics. Both these features suited Linnæus' character fairly well. He frequently quotes the writings of the Roman Stoics, in particular Seneca. Sometimes he does this in order to gain support from the classical authors, but almost equally often the quotations are made to convey nuances of his own line of reasoning. It would be very rash to conclude that Linnæus derived his opinions from ancient Rome, on the contrary his Stoicism displays many positively contemporary features. It should also be borne in mind that many of Linnæus' contemporaries, such as Anders Johan von Höpken, were adherents to the same ethical doctrine.

It has been argued that Linnæus' speeches on virtue and happiness contain downright classical features. The most personal expression of this influence is to be found in the above-mentioned funeral oration in memory of Neander, "whom fortune had hated and virtue defended".[3] Here we recognize the

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[1] *SLSÅ* 1925, p. 94.

[2] Ernst Cassirer, *Descartes*, Stockholm 1937, pp. 104 sqq.

[3] About Andreas Neander (1714–1765) see Th. M. Fries, *Linné*, II, pp. 285 sq.; Erland Ehnmark, *Dygden och Lyckan*, *SLSÅ* XXVII, 1944, pp. 81 sqq.

problem posed by Cicero and post-classical Stoicism. The fact that Linnæus also gives Virtue and Fortune a rather animistic concreteness reminiscent of theological speculation and medieval popular religion need not, however, detain us here.[1]

Virtue is the one firm ground of action. It is crowned by honesty and integrity in human conduct. Success and fortune become evil when they produce or promote evil. But fortune is a transitory and undeserved gain, even when accorded by God. Virtue itself easily becomes negative, if it is made the opposite of happiness. The pessimism of this conclusion thus becomes obvious, and the pessimistic strain in Linnæus' conception of Nature and ethics shines through the whole argument.

The retaliatory indignation in Linnæus' reactions to crime and guilt almost completely predominates over the retributive approval towards good deeds. In the entire *Nemesis Divina* there is, as Fries early pointed out, not more than one single clear example of the latter. This is less surprising when one considers that *Nemesis* is primarily a record of crimes. But this circumstance is fully explained only when we take into account Linnæus' pessimistic view of the course of nature as *bella omnium contra omnes*. "Life is lamentable", Linnæus exclaims in the same passage of the Prolegomena of *Lachesis*.[2] One is almost tempted to recognize such expressions as an echo of Hobbes, but one can also trace similar statements by Rousseau concerning a social condition under which, as Linnæus says, one man oppresses another, and does not live as his fellow man, and does not speak to him as his equal. Peasants and servants are robbed of their belongings, which are given away to others, and may become destitute, regardless of whether the majority of people are starving to death.[3]

These reflections show that the general problem of an equilibrium between good and evil was becoming as secularized for the young Linnæus as for Jean Jacques Rousseau. The crux of the period was how the wise rule of God was to be reconciled with such a world. And as the Theodicy question became more secular, the principle of justice emerged with growing distinct-

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[1] *ND*, p. 12 (MS 42).
[2] *LN*, p. 6.
[3] *DN*, p. 194.

ness; this was the case with Rousseau as well as with Linnæus.[1] It was in this mental milieu that Linnæus' idea of retaliation in this life took form. Three features characterize his way of thinking: the divine retaliation, the inevitability, and completion in this life of the retaliation, quite independent of a future existence.

In Linnæus' notes we come across many philosophical fragments derived from post-classical Stoicism, from the pioneers of empiricism, Bacon and Locke, from Descartes until the early Enlightenment. Undeniable influences from the physico-theological speculations of Christian Wolff have often been traced in the later writings of Linnæus. The question of external influence is, however, too complex to allow a simple solution, and the influences have indeed been overestimated. It is uncertain whether Linnæus ever attempted to state these problems more precisely, and whether posterity will be capable of doing so is even more uncertain; such speculations will therefore be avoided here as far as possible. Concerning the philosophical structure of Linnæus' idea of retaliation it would appear, from what we know of its author, to point in a reasonably clear and distinct direction within his practical philosophy. For him, as for many of his contemporaries, it appeared natural to identify the order of Nature with the moral order. It was a notion with a time-honoured tradition from antiquity. This idea entailed that the moral law was thought to have been implanted in human nature; and in combination with human nature was considered to represent a divine law of human conduct. It was apparently in accordance with this principle that Linnæus applied his ideas of human and divine justice to his theory of retaliation.

This theory could well balance between predestination and determination in this life. At times it seems doubtful from which level it should be interpreted. There is always some ambiguity in Linnæus' words when he speaks about metaphysics. The orthodox theologians blamed him for mixing up God and Nature. After his stay in the Netherlands his religious attitude, at all events, seems to have been quite undogmatic and in some respects inclined towards heterodoxy. In the *Lachesis*-MSS Linnæus presents his Natural theology as follows:

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[1] Ernst Cassirer, *Die Philosophie der Aufklärung*, Tübingen 1932, pp. 209 sq.

Nature does not regard Christ as the Saviour and God, nor as a God manifesting Himself from the Holy Ghost, Father and Son, an immaterial Soul, nor as the Resurrection of the flesh.[1]

This can hardly be comprehended in any other way than that Linnæus' religion of Nature paid little attention to the dogmas of the Church concerning the Divinity, Christ, the Trinity, or the immaterial nature of the Soul and the Resurrection. Among Linnæus' numerous aphoristically formulated utterances we can find the following, which may be regarded as an explanation of the declaration cited above:

God has shown himself in nature, *de quo dubitare nequeo.*
In the revelation differently, *in hinc hæsitavi.*
I did not see the revelation through Nature.
I was neither duped nor deceived.
Oh, poor people, how they are beguiled by imagination.[2]

Linnæus' personal position is perhaps best described in his own words:

Non credo Deum me creasse sed scio; quo pauciores enim articuli fidei eo melius.[3]

We have no reason to doubt that he ever essentially renounced such a position. But it seems possible that during his later years he modified it from the direction of a primitive monism towards more dualistic ways of thinking.

In *Diæta* and *Nemesis* the eternal penalties are never mentioned. In the Prolegomena to *Lachesis* Linnæus sums up his own understanding of the connection between body and soul in a way, which to a certain extent brings to mind Malebranche's occasionalistic theory. Such a tendency is also regarded by Boerhaave.[4] Some of these sentences seem worthy of rendering here:

Nature and the soul are inseparable companions, two in one.
The soul is situated between the cerebellum and the extended marrow.
The inner man has two sides; one governs the cerebellum and sets the will in

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[1] In the original: "Naturen ser icke *Christum salvatorem et deum S(ancto) S(piritu) et Patre et filio exeuntem deum, Animam immaterialem, resurrectionem carnis.*" *LN*-MSS, *Theologia*, fol. 18[r].

[2] *DN*, p. 191.

[3] *LN*, pp. 23 sq.

[4] Cf. B. P. M. Schulte, *Hermanni Boerhaave Prælectiones de morbis nervorum 1730–1735. Een medisch-historisch studie*, Leiden 1959, pp. 385 sq. Cf. p. 404.

motion, the other belongs to the extended marrow, apprehends and drives involuntary things.

The Soul and Nature often co-operate; often they fight each other; still more often they work separately.[1]

The word 'soul' is repeatedly used by Linnæus in its Latin form *anima*, and is regarded as a *particula divinæ auræ*.

So far as one can see, the sayings conform with Linnæus' philosophy of Nature. Linnæus regards *anima* as a material substance in accordance with ancient and later doctrines. With this point of view in mind one is inclined to believe that Linnæus renounced the ideas concerning the immortality of the soul. Several years ago the late Professor Erland Ehnmark of Lund urged such ideas.[2] It is likely that he was in the right. But when he deduces these ideas of Linnæus directly from the Roman Stoics, I think that he goes astray. When we remember how ambiguously the conception of the soul is conceived in the philosophy of more modern times, the Stoical interpretation in this, as in other instances, is too far-fetched.

An overwhelming problem at the end of the seventeenth and the beginning of the eighteenth centuries was the theodicy, primarily formulated in the philosophy of Leibnitz but taken over in many varying shapes in the spirit of the following period. With any pretensions of certainty at any rate, it is hard to state Linnæus' position in this respect. His disposition, his experience, and his view of life could seldom consent to regard our world as the best of all possible worlds. A pessimistic streak in Linnæus' thoughts is clearly shown during the later years of his life. His *Nemesis Divina* has sometimes been called a theodicy; if so, it would be an inverted theodicy.

In his comprehensive biography of Linnæus, Bishop Elis Malmeström tried to interpret Linnæus' thoughts and words in terms of the physico-theological philosophizing in Sweden in the 1740s and 1750s. Doubtless Malmeström is right in finding reflections of it in Linnæus' writings and statements from this period of his life. But the conclusions in this direction are scarcely sufficient to allow us to form a general opinion on Linnæus' ways of thinking throughout his life. To try to trace any profound influences from

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[1] See Introduction, p. 20.

[2] Erland Ehnmark, *Linnæus and the Problem of Immortality. Humanistiska Vetenskapssamfundets i Lund Årsberättelse 1951–52*, IV, pp. 63 sqq.

his countryside home in the thinking of the mature Linnæus would also be to labour in vain. At any rate such impressions are very scanty and of quite another kind. Hints of Old Lutheran ways of thinking appear to be totally lacking. Substantially very little is to be gleaned from terms such as "natural theology" and similar terms. It is well known that the Wolffian ways of thinking were infiltrated into the theological learning in Sweden in the middle of the eighteenth century. But this says nothing about Linnæus' attitude towards religion and even less about his religious outlook throughout his life.

In reality, everything that raised Linnæus' wonder and curiosity constituted a supernatural experience, a Hippocratic τὸ θεῖον. The immediate feeling revealed in this exclamation was the basic foundation of the religion that Linnæus had learned from the three realms of Nature. This naive feeling was expressed in cosmic visions, hymns to the Creator and thanksgivings to the Almighty. In the manner of the modern Stoics he sublimated his religious feelings in the "foremost of all passions", the admiration of God's created works. It was equally natural for him to think that God had created Nature for the sake of Mankind, and had appointed Linnæus as its High Priest. The reason for this outlook could have many causes. Stoicism was equally familiar with such ideas concerning meaning and election as St. Augustine and other teachers of Western civilization. The problem of an omnipotent and righteous God was actualized by many inner and outer circumstances in Linnæus' own life. It opened the gulf between good and bad, the result of which was that the antithesis of crime and penance could be bridged only by a Divine retribution in the temporal existence. The contrast between spirit and flesh, expressed in the Epistles of St. Paul which Linnæus quotes, opens very wide perspectives. Concerning the consequences of original sin and the hereditary factors, there prevails in Linnæus an insoluble ambiguity in meaning as well as in words. Apparently fundamental ideas of predestination and determination cannot be sufficiently clarified. In such a twilight his personal religion often becomes very hard to discern. In Biblical terms vengeance was laid in God's hands. But the divine right executed the punishment according to its own primordial law, *lex talionis*. Among the ancient peoples *Nemesis* was a daughter of Dike.

Linnæus' thoughts often move in a direction pointing beyond the world of the five senses. Our border-line between Nature and the supernatural is

blotted out by many of the experiences which Linnæus mentions as his own or those of other people.

The background of the *Nemesis* speculation is, in its origin, more mystical than religious. Its nuclear mystery is enveloped in the occult philosophy of Linnæus. In *Nemesis* his theodicy is merely secularized.

Conclusion

In the preceding chapters two main aspects of the personality of Linnæus as a man of science have been considered.

Primarily Linnæus' anthropological Dietetic was concerned with the physico-medical and socio-psychical conditions of life tending to preserve bodily and mental health. His recommendations must be viewed in connection with contemporary attitudes, habits and beliefs.

Secondly, the intellectual and personal fountains of knowledge which formed the symbol-milieu apparent in Linnæus' thoughts about medical and moral matters have been emphasized.

On the whole the scientific development of Linnæus shows a very conspicuous continuity, which was never basically broken, notwithstanding some periods of discouragement in his most active years and in his years of failing health. His weakness corresponds with discouragement and alternating signs of an approaching old age in the last two or three decades of his life. It is, however, difficult to establish any decisive turning-point. His most speculative period is incontestably from the late 1740s to the beginning of the 1770s. At this age memories of his youth seem to have been vividly recalled.

The empirical vein in Linnæus, very typical of a young man in the period of Enlightenment, never lost its strong hold on him. On the contrary, it increased through the large contributions of his many pupils which afforded new materials for systematization. It is important to bear in mind that from the very beginning Linnæus' systematical method was based on rationalistic and empirical arguments. Linnæus' systematics had been built on the dichotomy of sexuality in the realm of organisms. As time passed it grew into a universal dualistic principle. In this manner the distinctions in the morphological structure of the vegetable and the animal world became to him biological analogies. Hereafter Linnæus was often faced with the antithesis of the necessity and expediency in the course of nature. The antithesis merged on the one hand, into the question of body and mind

and on the other, into the question of the relationship between the order of Nature and the Moral order of the world.

Whatever may be said about the Linnean science of medicine, the Dietetic was its Alpha and Omega. His anthropological views were derived from Hipporcrates and Galen. Thereby, however, little is said about its real implication. We must not presume that Linnæus obtained his philosophy from Pliny and Seneca or his concept of causality from Aristotle. All such assumptions are vain, because between Linnæus and his Roman and Greek authors there is the pre-scientific learning of the Middle Ages and the Renaissance, and above all, the renewed thought of the old Platonism, the neo-Platonism, the neo-Pythagoreism and the neo-Stoicism, enfolded in the very wide robes of Hermetic science. And not only that, but also the neo-Paracelsian and neo-Hippocratic medicine of the previous century. All this should not be overlooked when speaking of Linnæus' scientific attitudes.

The empiricism and sensualism of the New Science could not, as we have seen above, have left the young Boerhaavian disciple of medicine unaffected. However, Linnæus became neither a spiritualist nor a mechanist in his views on Nature. It is rather astonishing to read the Lucretian epigraph, which Linnæus placed on the last page of *Clavis medicinæ duplex:*

Invenias primis a Sensibus esse creatam
Notitiam veri, nec Sensus posse refelli.
Qui nisi sint quousque falsa sit omnis.

Certainly, Linnæus was never a disciple of Democritus. But it should never be denied that he was a genuine son of his own century. Seen in the context of the flourishing endeavours of the time to gather new experiences, Linnæus cannot be blamed for an unreasonable interpretation of the evidence provided by the five senses. It seems to us more remarkable, however, that Linnæus did not deny the possibility of the existence of phenomena outside human sensory perception.

When Linnæus seeks for rational answers to questions of extra-sensory perception, his explanations are fundamentally based on psycho-somatic considerations about the dynamics of Life. In his view the immanently divine powers of Nature are combined with conceptions of resistance and

inertia. These can be overcome only through the reluctance of the endeavouring opposite forms to bring about or remove the hindrances in the way of an equilibrium which is structurally foreseen in the order of the Universe. Such dynamics presuppose efficient causes (*causae efficientes*) through which the conflicts are settled and the invariabilities somehow guaranteed. At least some deliberation of this kind seems to lie behind the symbolism of the Linnean *Lachesis*.

The dynamic aspect also reduces the *magia naturalis* to a belief in more or less mechanically conceivable activities and accordingly contributes to de-spiritualize the effect of profane magic. But neither science nor magic could dismiss the fluctuating concept of Substance. In accordance with this pattern the ontological connection between Substance and Virtue could not be given up. The occult qualities, primary or secondary, held the field secured for them especially in medicine. Although derided by sceptic poets, the differences between learned and unlearned medicine were practically undisturbed in Linnæus' lifetime, notwithstanding the many positive efforts he made to neutralize popular quackery.

However, the emancipation of the New Science was retarded by the old analogical and homological fashions of thinking about Nature. The relations of the microcosmic and macrocosmic world were decaying in the minds of scientists already during Linnæus' youth. Astrology and alchemy were still afloat, though with expiring lanterns in our polar waters. Linnæus does not mention them again. Only their concomitants, the iatro-chemistry and iatro-physics were revealed to him with faint symbolic values.

The symbols used by Linnæus are, however, not to be underrated. Linnæus was not only the creator of the world-renowned terms *Flora* and *Fauna*. His symbolism in *Lachesis* and *Nemesis* is even more profound, and although it derived from his early years, it became important to him in the 1760s. The symbols of life, generation and destruction were vividly active in his mind throughout the years. It is scarcely necessary to bring to mind the symbols of the flowering tree, the marriage of plants, the dead man's skull in the churchyard. Linnæus' Swedish language abounds in popular symbolism. His expressive symbol-talk is very often impossible to render in any other language. No doubt, these tendencies of Linnæus were often subconsciously motivated by their anchorage in his emotional mind-structure

and his urgent need for evaluating expressions. Much of this symbolism seems to be archetypally founded and, as in *Nemesis*, absolutely formulated.

Considerations like these cannot but lead to the homological thinking of Linnæus, his sweeping parallels and magical similarities, most typically manifested in *Clavis medicinæ duplex*, but, perhaps even more noticeable in the latest posthumously printed editions of his great work *Systema naturæ*. It is difficult to say how many of these views were intended as an apology when submitted before a contemporary forum of men such as Albinus, Haller, Swieten, Sauvages, and von Rosenstein. In any case *Clavis* is written in a rather esoteric medical style. Its medical philosophy is conspicuous enough but is also a link in the chain of the old philosophic tradition in medicine. The most central point is constituted by the symbolized aspect of life as such. All things, human as well as cosmic, are grouped around this marvellous principle of the world. Its fundamentals are the elements, its design is the pre-formed duality of generation, its perfection is the prevalence of quinary organic forms. The origins of these views were unmistakably inherited from the Renaissance and the Baroque. Marsilio Ficino was the great figure. The Genesis was *Corpus Hermeticum*. But the root-fibres should be sought in even more remote ages of Ancient Greece.

Whether this is accepted or not, we cannot dwell on the purely historical analysis of the conceptual origins of the Linnean symbolism. Its fundamentals lay much closer to Linnæus and his time. How much of his symbol-thinking covered his views on reality? It sounds rather paradoxical when Linnæus ends his *Clavis* by adducing evidence from the philosophy of Lucretius. This, however, is not very surprising as he had otherwise suggested similar ideas about the experience of the senses.

More important, at least as seen from outside, are Linnæus' views concerning the intricate problems of the coherences of the phenomena of Nature. Roughly speaking, he often seems to come to a stand-still at the point where his favourite author Seneca had left them in his *Quaestiones naturales*. Behind it all is the awkward question how, with his own eyes, and possibly also with the eyes of his contemporaries, Linnæus may have looked at sympathies as natural causes. When we remember that magic, as *magia naturalis* contained, for him at any rate, traces of truth, we are compelled to cut a very long story short. The plausibility of it is hidden in the fact that the doctrine

of sympathies in Nature always embraces some philosophy of natural causality. The great crux is the ambiguity of the concept of nature which meets us on nearly every page in the history of ideas since the opening of the Modern Age.

Linnæus' sense of reality made such questionings superfluous. It is very likely that he was never much intrigued by problems of this character. On the whole he stuck to his old vocabulary throughout his life. It is, however, not easy to say what exactly he always meant by the terms he used. This is certainly pertinent where the venerable hypothesis of sympathetic magic is concerned. At any rate the symbolic meaning of the homologies in his last works is conspicuous. Symbols are not seldom fragile and changeable, subject to transformation, ambiguous of evaluation and evanescent in more ways than one, but in the patterns of time they preserve a marvellous power of revival.

Obviously *Clavis* was intended as a paradigm and a confession. In the Preface the physicians were urged to stand fast on the solid double ground of reason and experience and not to follow the ways of the quack-doctors. The address is unknown. But the esoteric message is none the less apparent. The *Clavis* is the Linnean System of systems, too speculative to achieve a positive result, too hermetic to become a paradigm. From within, again, *l'esprit de la système* consists in the principle of motion, the Anima and the Creator. It forms the structure and the order of cosmic life. Inherently it is derived from God.

From our point of view the innermost motive of his system is a syndrome of philosophical, religious and magical symbols. *Lachesis* and *Nemesis* were for Linnæus not mere empty phrases. Together they actually represent, as two in one, his philosophy of the human condition and the sum of life.