

CHRISTIAN RICKMANN (1741-72) A FORGOTTEN PIONEER OF SOCIAL MEDICINE

BY

CYRIL C. BARNARD, B.A., F.L.A.

Librarian of the London School of Hygiene and Tropical Medicine

ALTHOUGH the literature on Johann Peter Frank is not inconsiderable—already by 1945, the bicentenary of his birth, it had amounted to nearly a hundred references¹—and particularly within the last thirty-five years his importance as a pioneer in public health has been fully recognized, only one author, so far as I am aware, has mentioned his indebtedness to Christian Rickmann. This is the more remarkable in that Frank himself handsomely acknowledges this indebtedness in the following words:²

In many ways I should have been very glad if those famous men, Baldinger and the late Rickmann, all too early snatched away by death, had forestalled me in these efforts, for both at one time had cherished the hope of publishing a work on Medical Polity. . . .

Rickmann propounded a plan, but no more, of his future work in which he had outlined for himself an order of publication for his Medical Polity.

This quotation is from my own translation³ in which I used 'Medical Polity' as a rendering of the German 'medizinische Polizey' in preference to the more usual 'Medical Police', because this to modern ears is too suggestive of a constabulary force. But I agree with Baumgartner and Ramsey⁴ that no English term of modern usage is exactly equivalent and, like them, I shall in the remainder of this article leave the term untranslated. As used by Rickmann and Frank it implied all the measures that can be taken by a state in carrying out its responsibilities for the health of its subjects.

Rickmann's death is recorded by Callisen,⁵ who also gives his name as the *praeses* of a thesis. His principal work, *Von dem Einfluss der Arzneiwissenschaft auf das Wohl des Staats und dem besten Mittel zur Rettung des Lebens*, Jena, 1771, with which we are here concerned and which I will henceforth for short call the *Einfluss*, is noted by Frank himself in his *System*⁶ (VI. Bd., 1. Th., p. xii), and by Wildberg.⁷ There is a short, thirty-word biographical note in Günther⁸ and a list of his works in Meusel,⁹ but he is not mentioned in Jöcher's *Lexicon* or in the *Allgemeine deutsche Biographie*, nor does his name appear in the medical biographical dictionaries of Bayle and Thillaye, of

Christian Rickmann
der Arzneiwissenschaft Doctor und ordentlicher Pro-
fessor bei der Akademie zu Gena, der römisch
kaiserlichen Akademie der Naturforscher
Mitglied

von dem
Einfluß der Arzneiwissenschaft
auf das Wohl des Staats
und dem
besten Mittel zur Rettung
des Lebens.



G e n a,
verlegt Johann Wilhelm Hartung
1771.

Title page of Rickmann's
Einfluss, 1771

*Reproduced from the copy in the Library of the
London School of Hygiene and Tropical Medicine*

Christian Rickmann (1741–72)—A Forgotten Pioneer of Social Medicine

Dezeimeris or of Hirsch, nor in any of the well-known histories of medicine. The only author to recognize Rickmann's importance is Fischer, who devotes to him about three dozen lines and a reproduction of the title-page of the *Einfluss* in his history of German public health,¹⁰ and five pages in an obscure journal¹¹ of which no copy exists in this country. The purpose of the present article is to rescue from this almost total oblivion the reputation of a pioneer in social medicine who deserved better of posterity.

Biographical information about Rickmann is meagre and what there is does not suggest a particularly eventful life. He was born at Lüneburg in the kingdom of Hanover on 24 January 1741, the son of Johann Heinrich Rickmann, chief magistrate at Lüneburg, and an assessor of the Court of Appeals in Celle. His mother came from the Wehrkamp family. After a period of instruction by private tutors young Rickmann was educated at public schools. Quite early he decided to take up medicine as a profession and, while still at school, attended lectures on osteology by a court physician and successful practitioner in his home town named Schaeffer, and on materia medica by Benefeld, who later became court physician at Schwerin. He matriculated at the University of Jena on 21 April 1761. He did not, however, consider himself fit to enter upon the study of the 'solid science' of medicine (*solidam medicinae scientiam*) until he had first prepared himself by philosophical studies. He therefore attended lectures on logic, both theoretical and practical, and on metaphysical doctrines by Johann August Schlettwein (1731–1802), who afterwards became a Hofrat in Baden. Thus prepared, he entered upon the medical course proper. The bulk of this was conducted by the Professor of Medicine, Johann Friedrich Fasel (1721–67), who in his zeal to ensure that his students received adequate instruction would not appear to have hesitated to encroach on the domains of his colleagues on the teaching faculty. In 1765 Rickmann graduated with a thesis¹² for which his *praeses* was Professor Fasel. Appended to this thesis is a *curriculum vitae* from which most of the above particulars are taken.

For the rest of his short life Rickmann seems to have remained in Jena. In 1768 he was admitted to the medical faculty as 'Privatdocent' and the next year was appointed 'ausserordentlicher Professor'. On 10 February 1772 he was, as Frank puts it, 'all too early snatched away by death' at the age of 31. Meusel⁹ lists nine original works by him, six in Latin and three in German, the last being the *Einfluss*, completed only ten months before his death. One of them, *Abhandlung von der Unwahrheit des Versehens und der Hervorbringung der Muttermahle durch die Einbildungskraft*, Jena, 1770, is of special interest, being an exposure of the popular fallacy that maternal impressions can by the power of the mother's imagination produce birth-marks in the offspring. It is the only one of his works that ran into a second edition, published posthumously in 1796. He had expounded the true

aetiology of birthmarks in a Latin treatise of 1769. He returns in the *Einfluss* to a discussion of the danger to public health of such popular superstitions, and its closing pages raise once again the question of birthmarks. Rickmann edited Fasel's book on forensic medicine, published in Latin in 1767, with a German translation in 1770. He is also known to have acted as *praeses* to at least two Jena theses, one defended by Johann Gabriel Doppelmayr in 1767, the other by Heinrich Karl Reich in 1768. To the latter he added a few words of congratulation. Whether, as was not unusual at that time, he took any share in the authorship of these two theses is not known. Nothing more is extant about his life or work. The variety of topics dealt with in his writings, which range from sneezing, dysentery and osteology to forensic medicine and birthmarks, does not suggest that he had yet begun to specialize, but at least one of his dissertations, his editing of the work of his former teacher Fasel, and above all the *Einfluss*, indicate a special interest in public health, and in legal and administrative medicine.

The *Einfluss* is not an easy book to read. It is not divided in any way into sections or chapters and there is no index or list of contents. Numerous irrelevant digressions and unnecessary repetitions obscure the main topics and, even when these have been disentangled, they do not appear to be set out in any logical order for stating the author's thesis. Ignoring all the extraneous matter, omitting the repetitions, and rearranging the order of topics, I have tried in the following summary to outline Rickmann's main argument. I have done this at some length because the book itself is scarce and will be accessible to very few readers. I have added captions for the main themes.

VITAL STATISTICS

Rickmann devotes considerable space to population statistics, taking most of his figures from the work of Süssmilch,¹³ according to whom there are 120 or 130 births to every 100 deaths. The average mortality is 28 per 1,000 living per annum. It is higher in towns than in rural areas and, of course, considerably higher in epidemic years than in others, but the average remains fairly constant. Mortality is greatest in infancy and each age has its constant average figure which falls from 1 in 4 in the first year of life to 1 in 200 at the age of 14 and 15, then rises again to 1 in 100 at 20 years, after which there is a more gradual decline, but each year still shows definite ratios until there are no more left to die, or so few that no definite proportion can be determined with accuracy. Out of every 1,000 persons who die, fairly equal numbers will be 5, 10, 20, 25, 30 and 40 years of age respectively. The remarkable thing is that the mortality records of various countries, such as England, Holland, France, Sweden and the provinces of Germany, show year after year almost the same figures, so that we cannot

doubt the existence of a divine order in the world. From these ratios Süssmilch reckons that by the twentieth year half of all those born have already died. Mortality is slightly higher in males than in females, but as the ratio of male births to female births is about 21: 20, it comes about that by marriageable age the two sexes are approximately equal in number.

The more numerous the population of a country, the greater its need for food, but also the greater in quantity and variety the product of the people's industry. A country cannot have too many inhabitants so long as its food industries have not reached the peak of their efficiency. It is possible for a prince who reigns for fifty years to see the number of his people doubled, to the great gain of the state, for the life of every citizen is of value. In England it is reckoned that the death of one subject represents a loss to the state of more than £100. The poor are injurious to a country, but nobody can be called poor who is industrious and practises economy.

According to Süssmilch, 1 in 6 or 7 of those born reach the age of 70, only 1 in 20 live to be 80. In Hensler's statistics,¹⁴ 11 out of 1,000 were over 90, including one who was 103, one 104, one 107 and one 109. Some, therefore, do reach extreme old age, a proof that man does not lack a predisposition to live long, if only it be not destroyed. It is not nature's fault that, through the many irregularities and hindrances that man very largely brings on himself, so few attain their natural term.

This leads on to that section of the *Einfluss* which is particularly discussed by Fischer.¹¹

NOSOLOGY

Rickmann divides diseases into four classes:

1. *Natural* diseases: those to which, without moral fault, the body of man is subject, due to all kinds of little incapacities of the organism to adjust itself to circumstances, most noticeable in childhood and in old age.
2. *Epidemic* diseases due to the air and weather.
3. *Infectious* diseases that are caught by one person from another. These first three classes may be called *physical*.
4. *Culpable* (*verschuldete*) diseases. These are the bodily results of neglect or moral fault either of the patient himself or his fellows.

These four classes are theoretically distinguishable but in practice nearly always mixed. There is no class that is not complicated with the others and such factors as bodily disposition, constitution and the weather play a large part. Although some diseases are sent by God and even in mortality rates a divine order is recognizable, yet man is endowed by God with freewill, he

can by his own fault bring diseases on himself and he does so only too often. Not all illness ends in death and man can either use or neglect the available means of cure.

QUACKERY

As many deaths are due to the mismanagement of quacks as to all other causes. Slight illnesses are made worse by irrational remedies; serious illnesses are made mortal by wrong treatment. Veterinary surgeons and sow-gelders that have fallen on evil days often become wandering operators who offer to treat such complaints as cataract, stone, hernia and fistulae. The horde of charlatans is recruited also from apothecaries, cuppers and barbers, who employ such methods as bleeding, purgations and emetics, and sell at high prices common drugs, which they give out to be cure-alls. Other methods particularly liable to be abused by charlatans are uroscopy, astrology, witchcraft and magic. Many of these impostors have purchased diplomas and licences from corrupt officials, some even have acquired by questionable methods the title of doctor from a university. These are more dangerous than all other quacks because it is difficult for common folk to distinguish them from genuine physicians.

The charlatan's success is due not only to his cleverness and plausibility but even more to his victim's gullibility. There is not only a lack of medical knowledge amongst common folk but an appalling amount of prejudice and superstition. (Rickmann gives many interesting examples and cites his own work on birthmarks mentioned above.) A spirit of fatalism is abroad amongst the peasants. Simple folk, when taken ill, say that if their time is not come they will recover without a doctor. Some do, but still more die who could have been saved by timely medical aid. But prejudice is not the only reason for neglecting to call in medical advice, the cost also bears heavily on a poor man and thus helps to support prejudice. He does not spare the cost where his cattle are concerned, because his livelihood depends upon them, but for himself, his wife or his children he goes without or uses a homely, often useless, remedy. Such people fall an easy prey to quacks and mountebanks of all kinds.

Charlatanry should be punishable by law. Such laws do exist in many countries but are not enforced. This is mainly owing to the lack of medical knowledge amongst the people. In the case of great common dangers, such as the plague, their results are manifest to all and easily understood, therefore the laws for protecting the public against them are obeyed. In the case of quacks, on the other hand, the danger is not realized and hence the laws are neglected. Fines are not enough to restrain such rogues: they would be passed on in increased fees to their victims. Corporal punishment that would expose them to infamy in the eyes of the public would be more effective.

Christian Rickmann (1741–72)—A Forgotten Pioneer of Social Medicine

It would be useful if a list of all quacks that become known to the authorities were compiled, so that they could be kept under close observation. Wandering practitioners should be prohibited from entering the country and the import of foreign drugs of unknown composition should be stopped. Advertisements of cure-alls should not be allowed in newspapers.

ORTHODOX MEDICINE

The art of the quack doctor is easy to learn, he has merely to memorize a list of remedies, one for each symptom, to be applied by rule of thumb. The knowledge necessary for the genuine practice of medicine is, on the other hand, far greater than most people imagine. The true physician must enlarge the knowledge gained by his own observations and experiences by studying those of the physicians of all times. The qualities that must be possessed by a good physician are described and his ethical behaviour is contrasted with that of the charlatan.

A certain kind of charlatan, the self-styled 'practicus', prides himself on his many years of experience, declares that success in the practice of medicine must be sought not in the study but at the bedside, and despises him not so old as himself. It is commonly but wrongly held that experience consists merely in purely sensory observation and blind practice without principles; a 'practicus' has visited many patients, therefore he has seen many diseases. But even many years of experience are of little profit to an unlearned physician. Observation and experience are the foundation of the healing art, but to benefit from the variety of circumstances at the bedside, the practice of this art must be based on a philosophy and a science.

HEALTH EDUCATION

Popular works by competent physicians would be of great use in instructing the people. Extracts might be made from the works of Tissot and from Zimmermann's book on dysentery,¹⁵ which contains much sound advice on methods for overcoming popular prejudices. Such works should be short and adapted to the understanding of peasants. They would explain those causes of disease that can be easily avoided by the common people, and such measures as are likely to be injurious during illness. In short, emphasis would be placed mainly, not on what one can do, but on what one should not do. Physicians should give the more intelligent members of the public, who are in contact with the others, definite and thorough instruction which would then gradually spread to the masses. The clergy too should be called in to help in this work. Priests are held in general respect and they could do

much in their sermons to warn the people against the virtual suicide of neglecting medical attention, of negligent or wrong care of the sick, and of following the bad advice of quacks. One of the best means of removing harmful prejudices and imparting useful knowledge is the calendar. These publications are bought in large numbers and the peasants read little else. Improved calendars, from which the questionable stories and ridiculous fairy tales, together with all the astrological rubbish, had been eliminated, should be licensed and the sale of all others prohibited.

BREAST FEEDING

It is no longer fashionable among mothers in the upper classes to suckle their own children. Either they employ wet nurses or the babies go without breast-milk altogether. This is harmful both to the mother and to the child. One has only to compare the healthy colour of the wet nurse with the pallor of the mother. Common experience shows that babies fed by wet nurses or deprived altogether of breast-milk die more often than do those fed by their own mothers. This is confirmed by the statistics of Deparcieux,* who puts the ratio at 5 : 3. The milk of the child's own mother is the best, because it is the most natural; that of wet nurses, who have already suckled another child for some time, has become too fat, caseous and strong. Babies reared on a wet nurse's milk or on no milk at all, even when they survive, have very often sickly bodies. They become constipated, have hardened glands or suffer from the English disease [rickets]. Also they do not cut their teeth so easily as those more suitably nourished. Moreover, wet nurses are apt to lack a mother's tenderness, to be careless in handling the babies and, if they have children of their own, these are likely to be neglected. Most illegitimate children starve for this reason.

INOCULATION

Rickmann recommends the inoculation of smallpox to prevent the appalling loss of life during epidemics of this disease. He was, of course, writing many years before the announcement of Jenner's discovery of vaccination. In Paris alone 13,550 persons died of smallpox within six months, which is two-thirds of all the deaths in a year. If only the prejudice against inoculation could be overcome and it could be generally used, a very large proportion of these lives could be saved. The names of a number of famous persons who support inoculation are mentioned to prove the respectability of the practice.

* I have been unable to trace any medical writer of this name. Probably the author meant is Des-Essartz¹⁶ whose book seems to deal with this very topic.

‘MEDICINISCHE POLIZEY’

The above discussions and many others, though they occupy more than four-fifths of the *Einfluss*, are only preliminary to the real core of the book which is introduced on p. 230 with the following words:

I have therefore always considered that it would be a very useful thing if a special, not unnecessarily lengthy, but clearly explained and ‘vollständige medicinische Polizei’, which is still lacking, were worked out by a physician.

Rickmann thought of writing such a work, but did not live to accomplish the project. It was left to Johann Peter Frank⁶ to take up the challenge and, after a lifetime’s work, bring the idea to fulfilment on a scale that perhaps would not have been quite in agreement with Rickmann’s conception of a ‘not unnecessarily lengthy’ work. Rickmann’s own ideas are set out in the last fifty or sixty pages of the *Einfluss* and may be summarized as follows:

Such a work would not only give necessary information to the authorities but could also be of use to everyone. ‘Polizey’ in general has as its object the welfare of the state and of every citizen in it, and directs men’s actions to this end. A ‘medicinische Polizei’ should form an important part of it and would promote the general health of citizens by changing many harmful circumstances. It would show how by suitable arrangements everyone suffering from illness or other infirmity could secure necessary help of all kinds, and how epidemics, either localized or widespread, such as smallpox, dysentery and plague, could be controlled. All ministers of religion should be invited to notify any dangerous disease as soon as it appears and warnings of epidemics should be given by official pronouncements of the health council, to be read from the pulpit and published in weekly papers. Amongst other public dangers, against which strict measures should be taken are food poisoning (due to bad wheat, food prepared in copper vessels, adulterated wine, etc.) and burial alive. On the latter Rickmann makes the surprising statement that ‘perhaps more people have been buried alive than have committed suicide, the English included’! Measures for rooting out malpractice and quackery, such as those outlined above, should be rigorously applied. The use of uroscopy in the practitioner’s own house, without his having examined the patient, should be prohibited. The supply of drugs should be rigidly controlled and apothecaries should be punished for accepting prescriptions from unqualified persons. Health councils, consisting of qualified physicians, should be set up to supervise medical examinations and the awarding of diplomas. To ensure that anyone, however poor, can obtain any necessary medical aid without fearing the expense, the state should provide the salary of qualified physicians, especially in small towns and rural areas. A health insurance fund would be formed to be financed out of contributions.

Rickmann apparently visualized these contributions as voluntary, for he adds: 'Even the well-to-do would perhaps give a contribution for the care and cure of the sick and destitute, regarding it as an act of mercy.' The poor would pay their small contributions as an insurance entitling them to help, treatment and nursing without further expense. The fund might be supplemented by death duties and allocations from public revenue or state lotteries. Every member would have free access to a physician and if necessary admission to a hospital.

A perusal even of the above summary, inadequate as it is, at once reveals how much Frank was indebted to Rickmann for fruitful suggestions. The very expression 'vollständige medicinische Polizey' in the title of his great work⁶ is taken literally from Rickmann, who in his turn, as he himself acknowledges, had taken it from Rau.¹⁷ In his autobiography,¹⁸ written in 1801, Frank seems to give the impression that he coined the term himself. He describes how, before leaving the University of Heidelberg after graduation, he was summoned by Overkamp, the Dean, asked to choose some subject on which he would like to work in addition to his professional activities, and given three days in which to think of his answer. On returning at the appointed time he explained his scheme. 'Your idea is a happy one,' said the Dean, 'how would you christen the child?' To this Frank replied, '. . . the name Medicinische Polizey would be very appropriate.' This was in 1766, some years before Rickmann's *Einfluss* appeared, but, either Frank did not intend to convey the impression that he invented the name or his memory after thirty-five years played him false, for still later, in 1817, writing of the concept of 'medicinische Polizey', he says, 'I neither begot this child nor presented it for baptism, but merely adopted it, immature and micromelic as I found it, and in the first ten years almost without help from anyone brought it up to a handsome size'⁶ (Bd. VI, 1. Theil, p. xii). He then lists sixteen previous works, going back to 1580, dealing with 'medicinische Polizey', in six of which the same or substantially the same term appears in the title ('police de . . . médecine' Dubreuil 1580; 'tractatus medico-politicus' Castro 1614; 'politia medica' Hoernigh 1646, Bajer 1727 and Baumer 1777; 'medicinische Polizeyordnung' Rau 1764).

Among topics discussed at length by Frank in his *System*⁶ that may well have been suggested by Rickmann are the following: population problems and vital statistics (in I. Bd.); the duty of mothers to nurse their children and its influence on the welfare of the state, and the organization of wet nurses (II. Bd., 2. Abt., 2. & 3. Abschnitt); healthful care of food and drink and the danger from harmful vessels and utensils (III. Bd., 1. & 2. Abt.); health insurance (IV. Bd.); danger of burial alive (IV. Bd., 2. Abt., 5. Abschnitt, and V. Bd.); the influence of the healing art upon the welfare of

Christian Rickmann (1741–72)—A Forgotten Pioneer of Social Medicine

the state, the very title of the *Einfluss* (VI. Bd., 1. Theil, 1. Abt., 1. Abschnitt); medical education (VI. Bd., 1. Theil, 1. Abt., 2. Abschnitt, and the whole of VI. Bd., 2. Theil); public examination and certification of physicians (VI. Bd., 3. Theil, 2. Abt., 10. Abschnitt); ordinances for apothecaries (Suppl. Bd., I, 2. Abschnitt); epidemics (Suppl. Bd., III, 2. Abt.). The problem of quackery, on which Rickmann has so much to say, also appears again in Frank's *Epistola invitatoria*.²

According to Fischer,¹¹ Rickmann's *Einfluss* was much used and appreciated in the eighteenth century by prominent physicians, which makes it all the more remarkable that it should have been so totally neglected since. In particular his proposal for the founding of health insurance funds was taken up, partly word for word, in a petition addressed in 1772 by the *collegium medicum* at Nürnberg to the city council, the manuscript of which is still preserved in the city archives, and also by Schwabe.¹⁹ Another author, Brinkmann,²⁰ uses Rickmann's expressions almost literally, but does not mention him by name, in discussing mortality rates. These, he says, are not necessarily ordained by the Creator, but are also the result of the physical and moral behaviour of man and other causes acting upon him, an obvious reflection of Rickmann's classification of diseases into 'natural' and 'culpable' (*verschuldete*). Fischer¹¹ attaches great significance to this nosology of Rickmann, which he says is entirely original and states for the first time the important principle that for the prevention of disease a 'natural' hygiene on the one hand, and a 'cultural' (moral and social) hygiene on the other, are both necessary and that both are embraced in the concept of 'medizinische Polizey'. Writers on industrial hygiene in the middle of the nineteenth century stressed the natural and social, but not the moral, influences indicated by Rickmann. Pettenkofer too dealt only with 'natural' hygiene. In the last quarter of the nineteenth century social factors came into prominence in connection with tuberculosis, and, since the beginning of the twentieth, social influences have been studied systematically, but so far have resulted only in industrial and occupational hygiene. A 'moral' hygiene as foreshadowed by Rickmann has yet to come.

For considerations of space, I have had to omit all mention of many interesting topics discussed in the *Einfluss*, because they are largely irrelevant to the main theme of this article. Many of them, however, throw sidelights on social conditions and beliefs in mid-eighteenth-century Germany, and for this reason alone the book is well worth reading.

ACKNOWLEDGEMENTS

To Dr. Karl Bulling of the University Library at Jena I am indebted for sending me, over twenty years ago when I first took up the study of Rickmann, a copy of the *curriculum vitae* in his thesis and other biographical particulars. The late Dr. Albert Predeek, formerly director of the same library, gave me further help at a later date. My thanks are also due to the staff of the Wellcome Historical Medical Library, who helped in tracing some of the often obscure references in Rickmann's text.

REFERENCES

1. B[ARNARD], C. C., Bicentenary of J. P. Frank, *Lancet*, 1945, **1**, 381.
2. FRANK, J. P., *Epistola invitatoria ad eruditos, de communicandis, quae ad politiam medicam spectant, principum ac legislatorum decretis*, Mannhemii, 1776.
3. BARNARD, C. C., The Epistola Invitatoria (1776) of Johann Peter Frank, *Janus*, 1935, **30**, 149-64.
4. BAUMGARTNER, L., and RAMSEY, E. M., Johann Peter Frank and his 'System einer vollständigen medicinischen Polizey', *Ann. med. Hist.*, 1935, **5**, 525-32; 1934, **6**, 69-90.
5. CALLISEN, A. C. P., *Medicinisches Schriftsteller-Lexicon . . .*, Copenhagen, 1830-45, 33 vols. (See Bd. 23: 1551, and Bd. 31, Nachtrag.)
6. FRANK, J. P., *System einer vollständigen medicinischen Polizey*, Mannheim, Tübingen and Wien, 1779-1819, 6 vols. in 8; Supplement-Bände, Tübingen and Leipzig, 1812-27, 3 vols.
7. WILDBERG, C. F. L., *Bibliotheca medicinae publicae . . .*, Berolini, 1819, 2 vols. (See Tom. II, no. 87.)
8. GÜNTHER, J., *Lebensskizzen der Professoren der Universität Jena seit 1558 bis 1858*, Jena, 1858. (See p. 129. Cited by Fischer.)
9. MEUSEL, J. G., *Lexicon der 1750 bis 1800 verstorbenen teutschen Schriftsteller*, 1811, **11**, 302-3. (Cited by Fischer.)
10. FISCHER, A., *Geschichte des deutschen Gesundheitswesens*, Berlin, 1933, 2 vols. (See Bd. II, pp. 14, 39-40, 86, 123.)
11. FISCHER, A., Natürliche und verschuldete Krankheiten, *Socialhyg. Mitt.*, 1932, **16**, 45-50.
12. RICKMANN, CHRISTIAN, *Dissertatio inauguralis medica de causis sternutationis eiusque effectibus . . .*, Jenae, 1765.
13. SÜSSMILCH, J. P., *Die göttliche Ordnung in denen Veränderungen des menschlichen Geschlechts . . .*, Berlin, 1742. (Cited from Index-Cat. Lib. Surg. Gen. Off.)
14. HENSLER, P. G., *Beytrag zur Geschichte des Lebens und der Fortpflanzung der Menschen auf dem Lande*, Altona & Lübeck, 1767. (Cited from Index-Cat. Lib. Surg. Gen. Off.)
15. ZIMMERMANN, J. G., *Von der Ruhr unter dem Volke im Jahr 1765 und denen mit derselben eingedrungenen Vorurtheilen . . .*, Zürich, 1767.
16. DES-ESSARTZ, *Traité de l'éducation corporelle des enfants en bas âge . . .*, Paris, 1760.
17. RAU, W. T., *Gedanken von dem Nutzen und der Nothwendigkeit einer medicinischen Policey-ordnung, in einem Staat*, Regensburg, 1763; 2. Aufl., Ulm, 1764. (Cited by Fischer.)
18. FRANK, J. P., Biographie, In: *Gesundheits Taschenbuch für das Jahr 1802 . . .*, Wien, 1802. (See pp. 29-30.)
19. SCHWABE, E., *Anweisung zu den Pflichten und Geschäften eines Stadt- oder Land-Physikus*, Erfurt, 1786. (See Teil I., p. 225. Cited by Fischer.)
20. BRINKMANN, J. P., *Patriotische Vorschläge zur Verbesserung der Medicinalanstalten*, Düsseldorf, 1778. (Cited by Fischer.)