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The Irish elephant, the whale penis and the child born with two heads
Animal and human autopsies in Leibniz's correspondence

Abstract

Leibniz's interest in the anatomy of animals and humans is reflected in his scientific correspondence, particularly in the aftermath of his Italian journey. Anatomical investigation of large mammals was facilitated by the study of the skeletons of dead or extinct animals. The examination of the bones of an elephant-like creature found in Gräfentonna (Thuringia) was reported by Wilhelm Ernst Tentzel in *Monatliche Unterredungen* (April 1696) and in a further publication *Epistola de sceleto elephantino* (1696). Tentzel also informed Leibniz about Allen Mullen's *An anatomical account of the elephant accidentally burnt in Dublin* (1682) and John Ray's *Synopsis methodica animalium quadrupedum* (1693). Whale hunting provided yet another possibility for the study of large mammals. In September 1697 Georg Franck von Franckenau provided Leibniz with anatomical details of a Norwegian whale.

Abnormality and deformity of new-born children, as well as of adults, is a frequent theme in Leibniz's correspondence after 1690. In March 1692 Bernardino Ramazzini reported a post-mortem examination of a "foetus monstruosus" in Modena. In March 1695 Jacques M. B. Bouquet informed Leibniz about the post-mortem examination of two deformed adults in Padua. In September 1697 Franck von Franckenau reported the birth of a girl with two heads near Copenhagen and supplied Leibniz with details of the post-mortem examination. Finally, when Leibniz's correspondent Rudolf Christian von Bodenhausen died in Florence in May 1698, he received a report on the cause of death by the Swedish physician to-be Magnus Gabriel Block who had examined the corpse. Although anatomical reports were commonplace in the journals of the late seventeenth century, Leibniz correspondence after 1690 reveals a pronounced interest in the anatomy of animals and humans as well as an awareness of the importance of autopsies for the advancement of pathological anatomy.

Animal autopsies

The general context of Leibniz's interest in the anatomy of large mammals was his occupation with natural history and in particular with the history and form of the earth. His posthumously-published *Protogeae*[1] was composed in the early 1690s and was publicly announced for the first time in an advertisement in the *Acta eruditorum* (January 1693). This projected work also forms the context of Leibniz's correspondence with the Hamburg pastor Caspar Büssing and in particular the exchange of views regarding the theories of Thomas Burnet, expounded in *Telluris theoria sacra* (1681-1689) and *Archaeologiae philosophicae* (1692), as well as the opposing interpretations given by Büssing in *De situ telluris … dissertatio mathematica* (1695) and by William Whiston in *A new theory of the earth* (1696). Anatomical investigation of large mammals was stimulated by the study of the skeletons of dead or extinct animals and was a natural by-product of the discussion of the issues arising in natural history. Thus, on January 3, 1697, Büssing asks of Leibniz[2]: "Nescio an videris quae Dn. Tentzelius edidit de Sceleto animalis Elephantiformis in Thuringia effosso". Wilhelm Ernst Tentzel had reported the excavation of bones at Gräfentonna in his journal *Monatliche Unterredungen* (April 1696) and in *Epistola de sceleto elephantino Tonnae nuper effoso, ad … Antonium Magliabechium*, published in Gotha and Jena in the same year. Tentzel, for his part, hoped to obtain a report from Magliabechi about the skeleton of an elephant in

1 This, and all titles referred to in the text, are cited in the volumes of the Leibniz *Akademie Ausgabe* (A).
2 A III,7 N. 60.

Florence. In a letter to Leibniz on April 22, 1696[3], to which the official judgement of the Collegium Medicum in Gotha concerning the discovery at Gräfentonna was attached, Tentzel refers specifically to two additional publications, namely Allen Mullen's *An anatomical account of the elephant accidentally burnt in Dublin on Fryday June 17 in the year 1681 … Together with a relation of new anatomical observations in the eyes of animals*, published in 1682 in London[4], and John Ray's *Synopsis methodica animalium quadrupedum et serpentini generis* (1693): "Mitto nuperrime apud nos editum judicium de ossibus praegrandibus effosis, quo illa pro fossili habentur. Ego tamen pro Elephantinis habeo, proximeque edam rationes sententiae meae in epistola Magliabecchio inscribenda, ut exemplar integri sceleti Elephantis, quod Florentiae est, accipiam. Omnia ad Anatomiam Elephantis Hibernicam et Rajanam examinabo, ostendamque, vera ossa fuisse, sed in arena succo minerali in lapidem conversa".

Fifteen years after the event, Mullen's dissection of the elephant was still attracting attention. In a report on Tentzel's *Epistola de sceleto elephantino,* in the *Journal des Sçavans* on 20 August 1696, the reviewer comments on Mullen's autopsy of the elephant in the following words[5]: "L'Anatomie d'un elefant publiée en Anglois à Dublin par Monsieur Moulin en 1681 s'acorde parfaitement avec les observations faites sur les os tirez de la colline de Turinge, soit pour le grand nombre de cellules qui partagent la tête, ou pour l'étenduë du crâne. Il est vrai que l'étenduë du crâne decrit à Dublin exceed du double le crâne trouvé en Turinge, ce qui persuade que ce dernier élefant estoit unefois moins grand que l'autre".

Following Mullen's dissection of the elephant, the skeleton was put on display together with a painting showing the organs. The details are recorded in an eye-witness account by William Petty. Writing to his cousin Robert Southwell on 24 September 1681 (old style) Petty gives a detailed account of the exhibition of the elephant. Although not published until the twentieth century, the relevant passage from Petty's letter is most informative:[6] "As for the Sceleton of the Elephant: It is well enough set together, soe as it hath cost the poor owner 30 ₤ between its death and this day. It is become a publick shew of the Painted picture; the Sceleton, the Trunk, Toung, gutts, Penis, Bladder and some parts of the Skin with the Anatomicall description of some other parts not now to bee shewn. The Sceleton is suspended, That it turns round about upon a Swivle fixt in the Beam of the House and at its just heighth. The particulars remarkable in the Sceleton are these, vizt:

1. The Ivory Tusks are not Teeth, but Horns; there being other Teeth besides, like those of other great Animalls.
2. There be 20 Ribbs of a side.
3. The bones of the Ulna and Radius, as also of the Tibia and fibula, do cross each other, as if they were Twisted–very different from other Animalls.
4. The Lower Jaw is far greater and thicker than that of any other Animall I know.
5. The bones of the foot have a generall correspondence with those of other Creatures, but very different in their proportions.
6. The Trunck hath a broad footing and insertion about and upon the Bones, which make the Nose".

An additional note is found in following letter, dated 4 October 1681: "I now returne to tell you, That the Shew of the Elephant will in some measure repaire the poore man's losses, for they get sometimes 20s a day, neither doth the Sceleton eate oates &c."

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3 A I,12 N. 357.

4 For futher information see K. T. Hoppen, *The common scientist in the seventeenth century. A study of the Dublin Philosophical Society 1683-1708*. London, 1970.

5 *Journal des Sçavans*, Tome 24, pp. 614-618; cf. p. 615.

6 Marquis of Lansdowne [i.e. Henry Petty-Fitzmaurice, 6th Marquess of Lansdowne], *The Petty-Southwell Correspondence 1676-1687. Edited from the Bowood Papers*. London, 1928 and New York, 1967; cf. pp. 94-96.

Although not referred to in Leibniz's correspondence, two further animal autopsies carried out by Mullen before his death in 1690 were reported in the *Philosophical Transactions*, namely *Discourse on the dissection of a monstrous double cat* and *Anatomical observations in the heads of fowl* [7]. As in the case of the elephant, the physician Mullen recorded his observations on the eyes of fowl and of fish, as well as on ears of fowl, drawing inferences between the organs of animals and of humans. Whale hunting and the import of exotic animals from distant lands offered yet another means of studying the anatomy of the largest mammals. On September 28, 1697 Georg Franck von Franckenau, then personal physician to the king of Denmark, reported to Leibniz that he had received coral, or coral algae, from Trondheim in Norway. In addition the remarkable penis, as well as the mandible or lower jaw – commonly known as boning or Fischbein – of a whalebone or baleen whale had been received[8]: "Nuper … accepi, nec non Nidrosia, volgo Drontheim, litophytum marinum. Inde res quoque paucos ante dies insignis balaenae priapus et mandibulae unde vulgo dictum *Fischbein* in Sartorium usum offerebantur". The same correspondent also reported that he had obtained specimens like the large spotted civet cat and tiger, the long-tailed monkey and brown squirrel from East India.

Human autopsies

On July 28, 1696 Leibniz's correspondent at the Court in Florence, Rudolf Christian von Bodenhausen, informed him about his insistence on self-treatment during illness and his reluctance to seek medical assistance in Italy. Bodenhausen's reservations centred on a perceived abuse of phlebotomy there:[9] "Sonsten habe ich etliche Monaht hero fast nicht wie ein Mensch gelebet, in dem ich bey 2 Monathen eine totalem lassitudinem mentis et corporis erlitten … hat auch nichts gefehlet den rest zu stielen, als daß ich die Schinder v. Aderlaßer nicht geruffen, welche allhier auch die stärcksten ohne einig medicament … mit indiscreten aderlaßen usqv' ad deliqvium ins grab schicken. Habe mich also selbst leiten wollen, v. bin … zu vorigen Krräfften kommen". Alas Bodenhausen's new lease of life was relatively short-lived. When his death ensued in May 1698 the corpse was duly dissected. The twenty eight year old Swedish physician to-be, Magnus Gabriel Block, who assisted during the post-mortem examination, informed Leibniz on May 12, 1698 about the passing of his friend and the cause of death. The autopsy had shown that Bodenhausen had died of an abscess of the liver in which, it was reported, four pounds of pus had been found:[10] "passò à miglior vita il. S. Barone di Bodenhausen … morto d'un ascesso del Fegato, in cui trovammo 4 libre di Marcia, aperto ch'avemmo il suo Cadavere".

Whereas Bodenhausen's demise had resulted from natural causes, abnormality and deformity of the new-born, of adults or of human cadavers were of particular interest to the medical practitioners among Leibniz's correspondents. Thus, on March 30, 1692, Bernardino Ramazzini reported from Modena about a post-mortem examination of a "foetus monstruosus"[11]. In the field of medicine Ramazzini was surely Leibniz's most important correspondent in the years following the Italian journey. In discussions they had during Leibniz's sojourn in Modena (from late December 1689 to early February 1690) Leibniz had urged Ramazzini to continue his medical and scientific investigation and to report his results accordingly. This led to the publication of a series of medical ephemerides for the years 1690-1694 entitled *Constitutiones epidemicae*, which were much

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7 A. Mullen, *Discourse on the dissection of a monstrous double cat, and an explanation of the figures of some of its parts*, in *Philosophical Transactions* XV (1685), 1135-1139 and *Anatomical observations in the heads of fowl made at several times*, in *Philosophical Transactions* XVII (1693), 711-716. These articles are reprinted by the Irish Manuscripts Commission in: *Papers of the Dublin Philosophical Society 1683-1709*. Volume I and II. Edited by K. Theodore Hoppen. Dublin 2008; see Vol. I, items No. 185 and No. 187.

8 A III,7 N. 139.

9 A III,7 N. 10.

10 A III,7 N. 190.

11 A III,5 N. 67.

acclaimed by Leibniz, and republished at Padua in 1714 as *Constitutionum epidemicarum Mutinensium annorum quinque*. Famine and epidemics, caused by flooding, drought and other climatic influences, as well as the impact of the war, had in those years wreaked havoc among the population in the region of Modena. Ramazzini, in his letter of March 30, 1692, outlines the shortages and difficulties in supplying the needs of the Italian and the allied Bavarian troops near Modena. He relates a case where a German woman at a camp at Spilamberto near Sassuolo gave birth to deformed female twins joined to each other at the breast and abdomen but otherwise of normal proportions; the twins were stillborn: "Sub initium Mensis Martii mulier Teutonica in Castro quodam quod Spilimbertum dicitur, non valde distans a Saxolo foetum monstruosum peperit, binas scilicet faemellas pectore, et ventre ad invicem connexas, caeterum justae erant magnitudinis, ac valde elegantes; vix editae mortuae sunt". The remains were presented to the ducal authorities in Modena where a post-mortem examination was carried out. Ramazzini explains that the pathologist who dissected the remains discovered that the twins had but a single heart, a single stomach, and a single liver; otherwise each individual had its own intestines and internal organs including a bladder, kidneys, spleen etc.: "Medicus illius Oppidi monstruosum hunc partum Mutinam detulit, ac Ser^{mo} Duci dono dedit; refert idem Medicus qui illum dissecuit, se unicum Cor, unicum Stomachum, unicum Jecur observasse, in reliquis unamquamque sua habuisse Intestina, Vesicam, Renes, Lienem etc." Finally the remains were given to Ramazzini himself for anointment and conservation among other cimelia: "Seren^{mus} Dux noster … foetum hunc mihi tradidit ad pollincturam, ut postmodum in Aulae Cimelio reponatur".

With regard to the case in question, Ramazzini took issue with the opinions of certain unnamed Galenist authors whose explanation for the deformity derived from a passage in book 11, chapter 10 of Galen's *De usu partium corporis humani.* There it was literally stated that drunken men have sexual intercourse with drunken women and that men, being oblivious to the crapulence or overindulgence, wherever on earth they be, copulate with women, in the same condition; accordingly human procreation is pathologically encumbered from the outset: "Hac occasione varios Auctores de Monstrorum generatione evolvens Galeni textum in hanc rem valde accomodum offendi; haec sunt Gal. verba, *De usu part*. l. xi. c. x. *Ebrii enim cum ebriis coeunt et qui prae crapula ubi terrarium sint nesciunt cum mulieribus ita affectis consuescunt, quo fit ut geniturae principium statim eo modo sit vitiosum*". In addition to the case in question, Ramazzini had been informed of a similar case of a deformed child born in Bologna about the same time: "Eodem tempore monstrum simile Bononiae natum accepi". And what were the lessons to be learned from these events? Ramazzini, for his part, suspected a connection between the shortages, the effects of the war and the epidemies of those years, on the one hand, and events such infant mortality or malformation on the other: "ecquid ex his portentis hariolabimur? graves Epidemias his duobus Annis experti fuimus, rei annonaiae angustia, si non graviter, ut Anno elapso, adhuc tunc nos urget, armorum strepitus circumsonat, sic cuncta maerore sunt plena".

On March 3, 1695 Jacques M. B. Bouquet, a surgeon in the service of Prince Maximilian Wilhelm of Hannover informed Leibniz from Italy about a recent earthquake in Padua; before the earthquake, however, anatomy and medicine had been the talk of the town, he tells Leibniz:[12] "on ne parle apresent à Padouë … que d'anathomie et de medecines, et quelque fois de Religion … sy ce n'est qu'il est arrive vendredy dernier à 5 heure d'Almagne du matin un Tramblement de Terre quy dura un demy cart d'heure. Il fit plus de peur que de male quoy qu'il fut fort grand". In anatomy too the caprioles of nature were to be observed. In Padua, before the earthquake, Bouquet had assisted a pathologist in dissecting a series of cadavers of which two were particularly interesting: "Sy vous estiés curieux des caprices de la nature Je vous entretiendroit de deux faits fort considerables". In the first case, dissection had revealed a spleen split into two parts, one being

12 A III,6 N. 99.

found in breast area and the other in the abdominal region: “entre quantité de corps ou cadaveres que nous avons ouvert à l’ospital ou au Theatre anathomique nous en avons Trouvé un quy avoit la moitié de la Rate dans la poitrine et l’autre moitié dans l’abdomen”. In the second case, the correspondent had assisted with the dissection of a corpse allegedly with two separate livers. The first liver was found in the normal position and had normal proportions; the second one was found inside the tunics of the diaphragm, had the size of two fists, weighed about two to three pounds and had a quasi-circular shape and a small lobe. The vena cava passed underneath this liver leading to other veins throughout the body for the reception of the blood from the arteries which were present in large number: “l’autre … avoit deux foy separé[,] un de la grandeur ordinaire et dans le lieux ordinaire et l’autre entre les Tuniques du diaphragme de la grosseur de deux poin[gs] et du pois d’environ deux à Trois livre aiant la figure quasy Ronde et une petite lobe, par dessous laquelle passoit la véne cave envoiant dans Tout son corp quantité de venes pour Recevoir le sancq des arteres quy y estoit en Tres grand nombres, voila ce que J’ay vuë et que Je puis affirmer ayant moy mesme aydé l’inciseur anathomique à la dissection de ces deux corps”.

In the following letter, sent from Turin on June 11, 1695[13], Bouquet provided Leibniz with further details about the circumstances of these autopsies. In the case of the corpse with the split spleen, they had been dealing with a crippled man, a school master by profession, who had never been able to walk. Because of his illnesses and disability, the organs in the lower abdominal region were swelled, pressed together and upwards. His circumstances provided an explanation for the man’s split spleen. Part of the oversized organs had, he explains, been pressed into the breast region as a result of the expansion of the diaphragm: “Celuy de la Rate estoit un mestre d’escolle du lieux mesme lequel avoit esté sujet à plusieurs Indispositions non point causé par le derangement de ce viscere mais quy estoient la cause que ce viscere estoit sortis de sa place (Je m’esplique). C’est homme estoit un cul de Jate quy n’avoit Jamais marché”. He had suffered for a long time from diseases which had left him with obstructions in the lower abdominal region and which had led to swelling of all the parts; the result was that all organs of the lower abdomen were compressed, either because of their size or the fact that the man, as an invalid, was always seated. Thus, all of the innards of the lower abdomen and the spleen had been pushed upwards; the latter had an exceptional size, length and hardness and, by pressing continually against the diaphragm, had dilated its membranes and created an opening into the breast section of the body. In this way an extension of the diaphragm, which had the appearance of a little pocket into which half of the spleen had entered, had occurred: “Il avoit euë depuis lontans des maladies quy luy avoient lessé des obstructions dans Tout le bas ventre et quy en avoient Tumefié Toute les parties continuë, de sorte que cest homme ayant Toutes les parties du bas ventre fort comprimé Tant par leurs grosseurs que par la situation de cest homme quy estant Tojour assis poussoit ver en haut Touts les visceres du bas ventre et la Rate quy estoit d’une grosseur[,] longeur et dureté extraiordinaire poussant continuellement contre le diaphragme dilatoit Inssenssiblement ses membranes et se fesoit un entré dans la poitrine par un alongement du diaphragme quy paroissoit come un petit sacq dans lequel la moitié de la Rate estoit entré”.

In the case of the corpse with two livers, Bouquet and the pathologist had only been able to examine the liver found wrapped between the membranes of the diaphragm and which was first thought to be the heart. On closer examination, however, it was found to resemble a liver, both in terms of its form and substance, but also because of the passage of the vena cava as well as the distribution of veins and arteries throughout the body. There was, however, neither a vesicle of the gall nor a gallbladder leading to the intestines: “cest Inciseur quy est un medecin de l’ospital et moy ne pume faire autre chose que d’examiner cest partie quy se Trouvoit entre les membranes du diaphragme et que le medecin prit d’abord pour le coeur decendu dans l’abdomen, nous ne le

13 A III,6 N. 130.

Reconume pour foy ou pour mieux dire nous le nomane ainsy qu'apres avoir ouvert la membrane dans laquelle Il Estoit Envelopé et avoir conssideré la similitude qu'il avoit avec le foy. Tant par sa figure et construction que par sa substance[,] le passage de la véne cave et la distribution des vénes et des arteres dans Tout ce corp. Il est vray qu'il n'y avoit ny vesicule du fiel ny conduit bilaire alant aux Intestins".

The final example is an autopsy provided by Georg Franck von Franckenau in the aforementioned letter to Leibniz of September 28, 1697. In August of that year the wife of a school master near Copenhagen, already mother of several children, gave birth to a two-headed girl. The still-born child was brought to the Royal Palace where the remains were examined by Franck von Franckenau: "Nuper d. 9. Aug. duobus Hafnia lapidibus ludimagistri uxor, plurium antea liberorum mater edidit puellam bicipitem, cetera satis elegantem. Eam altero a partu die ad nos delatam in aula Regia augustissimi conspectui exposui et demonstravi". His eldest son Georg Friedrich then carried out a post-mortem examination. It was found that several organs were duplicated including the trachea or wind-pipe with outgrowths, the oesophagus or gullet, the stomach with the small intestine extending to the middle of the ileus and terminating in an ample or spacious sac, the spine, the lungs and the ribs. "offendimus multas partes geminas, tracheam puta cum thymis, oesophagum, stomachum cum intestinis tenuibus ad ilei usque mediam, ubi in amplum desinebant saccum, spinam dorsi, pulmones, costas". The remaining organs were found singly and included the heart, the liver, the spleen, the kidnies, the adrenal glands, the urinary bladder, the uterus, the pancreas, the mesentery and the cunt: "reliquas vero simplices et rationales[,] e. g. cor, hepar, lienem, renes cum succenturiatis, vesicam, uterum, pancreas, mesenterium; cunnumque". The body had two arms and two legs, all provided with nails: "brachia duo, totidemque pedes, utrinque unguibus suis instructos". Following the exenteration, and a public viewing by several thousand visitors at his residence, the remains were laid in a container filled with a fluid of florantibalsam (spiritus balsamicus) and taken to the Royal Museum for preservation: "Post exenterationem et confluxum multorum millium hominum ad aedes meas puellam liquori balsamico spirituoso immersimus in vitro capaci, museoque Regio intulimus".

Conclusion

As in the case of Ramazzini, Leibniz urged the medical practitioners among his correspondents to undertake and continue medical observation and investigation and to report their results. This was done both in letters and publications including medical ephemerides. Throughout Leibniz's adult life autopsies of animals and humans were being increasingly reported in such medical ephemerides. When, in 1670, the German medical society, the *Academia Naturae Curiosorum*, started to publish its *Miscellanea Curiosa sive Ephemeridum Medico-Physicarum*, autopsies wre already commonplace in the medical profession. The first volume contains a number of *Observationes* including *Observatio VII. D. Caroli Raygeri Anatomia monstri bicipitis*, *Observatio XV. D. Georgii Segeri Phthisici pueri anatome*[14], and *Observatio LV. D. Joh. Georgi Greiseli Anatome monstri gemellorum humanorum*. Similar reports are found in the following years and decennia in this and other journals. Outstanding personalities like Leibniz or Antonio Magliabechi were seen as authorities and were chosen as addressees for personal letters or sometimes for an open letter, a printed *dissertatio epistolaris*, like Tentzel's *Epistola de sceleto elephantino*. In both the journals and in the letters sent by medical practitioners to Leibniz, the focus is often on the gigantic (the anatomy of the elephant or the whale) or on the monstrous (abnormality or malformation). Besides such fascination for outlandish phenomena, there is also evidence of a growing awareness of the importance of autopsies for the advancement of pathological anatomy and medical treatment.

14 Regarding Segerus' description of the dissection of a boy who had died of phthisis, see S. Jarcho, *Problems of the autopsy in 1670 A.D.*, in *Bull. N. Y. Acad. Med*., 47 (Jul. 1971), pp. 792-796.