Encyclopedias have been said to be “the most important monuments of the history of science and civilization.” As such, the Encyclopédie, ou Dictionnaire raisonné des sciences, des arts, et des métiers, the summa of the Enlightenment in France, provides invaluable insights into that era of Western culture. Its essence embodied faith in human reason and observed truths detected using the senses and validated through experimentation. Its model was no longer the philosophy or theology of the ancients, but that of the sciences of mathematics and physics of the Scientific Revolution that had begun in the century preceding the Enlightenment. Thus, during the Enlightenment, all was reason and experiment.

The first volume of the Encyclopédie appeared in Paris in 1751 and was a major publishing event (4,000 copies sold) that generated large profits for the publishers. The project started in 1743 as an attempt to translate into French the Cyclopaedia or Universal Dictionary of Arts and Sciences (1728)
of Ephraim Chambers (1680-1740), but by 1745, evolved into a project that was to become the most important work of the French Enlightenment. The *Encyclopédie* was a long and tedious project of almost 3 decades (Box 1 and 2).

Volumens I-VII were edited by Denis Diderot and Jean-Baptiste le Rond d’Alembert, and volumes VIII-XVII, by Diderot alone.4

The *Encyclopédie* was attacked by the Jesuits, Jansenists, and various individuals around and within the French court, but defended by Madame de Pompadour (1721-1764), Louis XV’s mistress, and Guillaume-Chrétien de Lamoignon de Malesherbes (1721-1794), director of the *Librairie* (The Office of Censorship). This protection allowed continued publication of the *Encyclopédie* outside France after 1759 and importation of the bound volumes thereafter.

The *Encyclopédie* achieved technical and critical acclaim and had considerable political and social influence. The contributors were reformers, but moderates, who aimed to integrate into daily life the theory and practice of the sciences, gave special importance to the mechanical arts, and celebrated the importance of technology. As a reasoned dictionary of the sciences, arts, and crafts, the *Encyclopédie* brought the *esprit de géométrie* (spirit of geometry, ie, rigorous logic) into medicine. It reflected the contemporary shift away from old ideas of scholasticism, which, having reached their nadir to the point of infertility, were unable to further expand knowledge and were destined to death. According to historian of medicine Kurt Sprengel (1766-1833),

This was especially true for medicine, which in comparison with the other sciences had a heavier burden of mistakes and superstitions to unload, to achieve a conquering attitude and deserve the merit and of the title of an experimental science.5

### Box 1. Timeline and Composition of the *Encyclopédie* (1751-1780)

<table>
<thead>
<tr>
<th>Part</th>
<th>Timeline and Composition</th>
</tr>
</thead>
</table>
| **Part I** | Vol I-VII (1751-1757): the Parisian printers during these years were Briasson, David, Le Breton, and Durand  
○ Edited by Denis Diderot and Jean-Baptiste le Rond d’Alembert |
| **Part II** | Vol VIII-XVII (1765): Neufchastel, S. Fauclot et Cie  
○ d’Alembert had resigned  
○ The name of Diderot was deleted for security reasons and for the new contract with the publisher, Le Breton, who had changed the text of many entries without permissiona |
| **Part III** | 11 Volumes of illustrations (1762-1772)  
○ Vol I-IV: Paris, Briasson, David, Le Breton, Durand  
○ Vol V: Paris, Briasson, David, Le Breton  
○ Vol VI: Paris, Briasson, Le Breton  
○ Vol VII-XI: Paris, Briasson |
| **Part IV** | 4 Volumes of supplements (1776-1777): Paris, Panckoucke, Stoupe, Brunet; Amsterdam, M.M. Rey  
○ Diderot’s name does not appear |
| **Part V** | 1 Volume of illustrations (1777): Paris, Panckoucke, Stoupe, Brunet; Amsterdam, M.M. Rey  
2 Volumes of indices (1780): Paris, Panckoucke; Amsterdam, M.M. Rey |

aFortunately, the lost parts of these entries were saved in the United States. Source: Huard.3

DENIS DIDEROT

Diderot, universal thinker, philosopher, poet, writer, mathematician, art critic, theorist who anticipated aspects of evolution by natural selection, and expert on commerce, dedicated himself to the quest of reform in every field of culture and life that was the *zeitgeist* (spirit) of the time. For Diderot, reason was man’s guide and the judge of sensation and facts, and even abstract science had to concentrate on facts. Although his father had wanted him to study medicine, he studied law, religion, and philosophy and decided to become a writer. However, of the 2 editors of the *Encyclopédie*, he had the richer background and interest in medical matters. Before starting work on the *Encyclopédie*, he had translated (1744-1747) into French A *Medicinal Dictionary* (published 1743-1745) of Robert James (1705-1776). During the translation, he acquired consider-
able knowledge in anatomy, pharmacology, physiology, chemistry, physics, and the history of medicine, in which he maintained a lifelong interest.

It was during his editorship of the *Encyclopédie* that he published in 1773 *Éléments de Physiologie*, a philosophic exposition of the human body based on the work of the eminent physiologists of the time: Albrecht Haller (1708-1777), Julien Offray de la Mettrie (1709-1771), Theophile Bordeu (1722-1776), and Georges-Louis Leclerc, Comte de Buffon (1707-1788). From 1745 on, Diderot was busy with the project of the *Encyclopédie*, initially with
d’Alembert and subsequently alone. For the Encyclopédie, he selected the contributors, assigned the entries, reviewed the articles, organized the paginations, read the proofs, corrected drafts, organized the illustrations, and supervised the printing. He was in nearly constant contact with practically the entire intelligentsia of the time. In 1751, he became a member of the Royal Academy of Science and Humanities of Prussia. This was an exception, for he was never accepted as a member of any other European academy; his application for membership to the Royal Society of London was rejected thrice.

Because of Diderot’s cultural fame and well-selected personal library, in his last years, he had a close relationship with Catherine II of Russia (1729-1796), who took interest in encyclopedists in general. She invited him to St. Petersburg, made him her personal cultural advisor, granted him a pension and an apartment, and provided the money for his funeral so that Diderot could be buried in a Parisian parish church. His library had been sold to Catherine II before the invitation to Russia.

JEAN-BAPTISTE LE ROND D’ALEMBERT

d’Alembert was an illegitimate child who was left by his mother on the steps of the Church of Saint-Jean-le-Rond in Paris; hence his name. Unlike Diderot, he studied medicine for 1 year, but abandoned it to dedicate himself to the study of mathematics. d’Alembert was better acknowledged than Diderot for his scientific contributions, and in 1741, he was admitted to the Academy of Science, of which he later became secretary for life. For him, all sciences had to be factual; in the Discours préliminaire des éditeurs (preface), he wrote:

Physics makes observations and calculations, medicine investigates the human body, its diseases and their remedies, chemistry studies the composition and decompositions of various bodies, and natural history concentrates on descriptions of animals, minerals and plants.

Essentially, there was no room for opinion, just observations of facts and their consequences. A great physicist, expert on equinoxes, fluid motion, and vibrant cords, d’Alembert resigned from editing the Encyclopédie in October 1759.

THE ENLIGHTENMENT

The Encyclopédie reflects the spirit of the Enlightenment, the dominant philosophical movement of the 18th century, which originated in England, France, Germany, Italy, and, to some extent, Russia and Portugal. Rooted in the belief that human progress originates from human reason, reason was viewed as the ultimate source of any authority and was considered a defense of scientific and technical knowledge (providing for the continuous transformation of the world), as well as of religious tolerance and the natural rights of man. Reason refuted metaphysical systems, privileges, and tyranny and criticized religion. It was reason based on and controlled by experiment and experience. Its paradigm was the physics of Isaac Newton (1642-1727), who did not advance hypotheses (“hypotheses non fingo” [“I invent no hypothesis”], but observed natural phenomena and validated them experimentally before formulating his laws of gravity.

MEDICINE IN THE ENCYCLOPÉDIE

Medicine had no designated place in the title or frontispiece of the first volume, in which reason, philosophy, theology, history, and physics, along with other sciences, are illustrated under the vault of an ionic temple representing truths. However, the preface of the first volume classified medicine under the physical sciences, recognized its importance as a measured science, assigned to it the spirit of geometry typical of the Enlightenment, and defined its task as concentrating “on [the] history of [the] human body, its diseases and cures.” In addition, the introduction of volume III declared that medicine should be assigned a space not smaller than that given to law.

Medicine in the Enlightenment fully incorporated contributions from other sciences, such as physics, chemistry, botany, and measurement. This explains the emphasis on Santorio Santorius (1561-1636) and Albrecht Haller. The latter is recognized in the first volume of the supplement:

Anatomy and physiology have been written by Albert Haller a member of nearly all academies in Europe and president of that of Göttingen. His writings [were] enough to make the reputation of many persons. He identified, dem-
The Encyclopédie foresaw the advent of reanimation in the entry on “life,” defined by “the presence of the movements of organs necessary for the circulation of blood and for respiration, or just the movement of the heart even in imperfect state.” The entry on “hygiène,” written by Arnulphe d’Aumont (1720-1800), professor at the University of Valence, provided the basis of public health; thus “hygiene became the principal instrument of health.” This guiding principle of the citizens of the Republic of Letters permeated the Encyclopédie, wherein medicine and public health were considered the best means to improve the lives of people. 

The 139 contributors to the Encyclopédie were selected and recruited by Diderot, d’Alembert, and the publishers. Some wrote an isolated article, whereas others contributed to several entries. No women seem to have been included. The medical contributors were well-selected scientists (Table 1).

THE KIDNEYS AND THEIR DISEASES IN THE ENCYCLOPÉDIE

The kidneys and their diseases are covered extensively in the Encyclopédie: there are entries on kidney structure and function, normal and pathologic urine, diabetes, edema, nephritis, diuretics, physiology, kidney stones, renal colic, polyuria, dysuria, stranguria, and incontinence. What follows is our translation of selected excerpts from the Encyclopédie for the entries on the kidney, urine, bloody urine, and diabetes, for which English translations are not available.

“The Kidneys,” Translated From Encyclopédie Supplement, Volume IV

The kidneys are 2 extraperitoneal organs. They are located between the lumbar ribs and muscles, on the right and left side of the spine, and are embedded in a fatty environment. On the left, the kidney is behind the spleen, and on the right, behind the liver. The kidneys are the most dense visceral organs, move with respiration, and the lower pole of the right side is below that of the left side. In the kidney, one distinguishes a cortical part, which is yellow, soft, and highly vascularized, and a medullary part, which is more dense, whiter, and more consistent, made of lobules, which in adult humans are joined together. Here, we recognize pyramidal structures of different size, in which are columns consisting mainly of tubular conduits. The pyramidal columns show pores opening in the pelvis, which is continuous with the ureters that are connected to the bladder. [The kidneys receive] one fourth of the blood of the abdominal aorta.

For Malpighi, the kidney was a glandular organ made by small arteries forcing their fluids into a spherical cavity continuous with a small urinary conduit. The most colored part of the blood is separated in these glands . . . urine may be clear like water. There is continuity of the arteries with the urine conduits. It is probable that such conduits originate in the serpentine vessels and open at some distance in common channels emptying urine into the pelvis. It cannot be doubted that urine is brought to the kidney by arteries, is poured in the urinary conduits and received into the ureter. An identical road is covered by lithic matter or the calculous clot preceding stone formation. When the ureter is obstructed, it swells upstream; thus, water, urine, and stone matter give origin to masses, the pelvis dilates, and the kidneys are full of urine. It has been speculated that because of the short time between ingestion of mineral water and urinary excretion, a direct connection between gut and bladder might exist, but this has never been demonstrated. [The kidneys are illustrated (Figs 1-3) in the first volume of the Planches (Plates) of the Encyclopédie on anatomy.]

“Urine,” Translated From Encyclopédie, Volume XVII

Galen was the first to show, by ureteral ligation, that urine is separated in the kidneys. [Urine] is neither separated by attraction nor through fermentation, emulsion, or precipitation. At the end of the artery, it is colorless and subsequently acquires color in the tubules. Abundant urine indicates relaxation of the urinary channel or a reduction of perspiration, sweating, or salivation. The contrary may advance suspicion of plethora and convulsion. Clear, transparent, insipid, colorless, and tasteless urine indicates contraction of the kidney vasculature, a great
movement of humors, and gives the same indication as abundant urine that heralds convulsion and death. Red urine without sediment, in acute illnesses, foresees a long-lasting and dangerous disease. Dense and copious sediment heralds dropsy. Green urine indicates the presence of bile in blood, which is eliminated by the kidneys. Black urine gives the same indications as green urine, but with a higher malignity.

In acute fevers, urine with light, whitish, odorless sediment at the beginning of a disease carries a good prognosis. Thin red urine without sediment, thin white urine, or thin turbid urine without sediment all denote a dangerous disease.

**“Bloody Urine,” Translated From Encyclopédie, Volume XVII**

The presence of blood in urine is the origin of a reddish color. When the quantity of blood is modest, it may be difficult to

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**Table 1. Medical Collaborators of the Encyclopédie**

<table>
<thead>
<tr>
<th>Name</th>
<th>Dates</th>
<th>University Conferring Medical Degree</th>
<th>Position (Location)</th>
<th>Contributionsa</th>
</tr>
</thead>
<tbody>
<tr>
<td>Barthez, Paul-Joseph</td>
<td>1734-1806</td>
<td>Montpellier</td>
<td>Prof (Montpellier)</td>
<td>22; 15 on anatomy</td>
</tr>
<tr>
<td>Bordeu, Theophile</td>
<td>1722-1776</td>
<td>Montpellier</td>
<td>Pract (Paris)</td>
<td>1; crisis in disease</td>
</tr>
<tr>
<td>Bouillet, Jean</td>
<td>1690-1777</td>
<td>Montpellier</td>
<td>Pract (Beziers)</td>
<td>2; medicine, physiology</td>
</tr>
<tr>
<td>Bouillet, Jean-Henri</td>
<td>1729-1790</td>
<td>Montpellier</td>
<td>Pract (Beziers)</td>
<td>1; medicine</td>
</tr>
<tr>
<td>Cadet, Louis Claude</td>
<td>1731-1799</td>
<td>Paris</td>
<td>Pharmacist</td>
<td>2; bile, borax</td>
</tr>
<tr>
<td>Chabrol, Mathieu</td>
<td>1735-1815</td>
<td>Parisb</td>
<td>Surgeon (Mezières)</td>
<td>Supplements</td>
</tr>
<tr>
<td>d’Aumont, Armphile</td>
<td>1721-1800</td>
<td>Montpellier</td>
<td>Prof (Valence)</td>
<td>Many (192); diabetes, hygiene</td>
</tr>
<tr>
<td>Falconet, Camille</td>
<td>1671-1762</td>
<td>Paris</td>
<td>Prof (Lyons)</td>
<td>Use of his library</td>
</tr>
<tr>
<td>Fontana, Felice</td>
<td>1730-1805</td>
<td>Padua</td>
<td>Physicist (Pisa, Florence)</td>
<td>1; retina (in supplement)</td>
</tr>
<tr>
<td>Fouquet, Henri</td>
<td>1727-1806</td>
<td>Montpellier</td>
<td>Prof (Montpellier)</td>
<td>6; medicine, physiology</td>
</tr>
<tr>
<td>Grunwald, Frederick</td>
<td>1734-1826</td>
<td>Dresden</td>
<td>Pract (Paris)</td>
<td>Supplements; breast feeding</td>
</tr>
<tr>
<td>Haller, Albrecht</td>
<td>1708-1777</td>
<td>Leiden</td>
<td>Prof (Gottingen)</td>
<td>Many (100 +); supplements</td>
</tr>
<tr>
<td>Hoin, Jean-Jacques</td>
<td>1722-1772</td>
<td>Dijonb</td>
<td>Surgeon (Dijon)</td>
<td>1; hernia</td>
</tr>
<tr>
<td>Jaucourt, Louis</td>
<td>1704-1780</td>
<td>Leiden</td>
<td>Pract (Paris)</td>
<td>Many; history of medicine</td>
</tr>
<tr>
<td>La Fosse, Jean</td>
<td>1742-1775</td>
<td>Montpellier</td>
<td>Prof (Montpellier)</td>
<td>46; legal medicine</td>
</tr>
<tr>
<td>Lavivotte, Louis-Anne</td>
<td>1725-1759</td>
<td>Paris</td>
<td>Pract (Paris)</td>
<td>1; medical training</td>
</tr>
<tr>
<td>Le Monnier, Louis Guillaume</td>
<td>1717-1799</td>
<td>Paris</td>
<td>Prof (Paris)</td>
<td>6; magnetism, electricity</td>
</tr>
<tr>
<td>Le Preux, Paul-Gabriel</td>
<td>?-ca 1800</td>
<td>Paris</td>
<td>Prof (Paris)</td>
<td>2; apoplexy.</td>
</tr>
<tr>
<td>Le Roy, Charles</td>
<td>1725-1779</td>
<td>Montpellier</td>
<td>Prof (Montpellier)</td>
<td>2; mineral waters, ascites</td>
</tr>
<tr>
<td>Louis, Antoine</td>
<td>1723-1792</td>
<td>Parisb</td>
<td>Surgeon (Paris)</td>
<td>Many (449); surgery, plates</td>
</tr>
<tr>
<td>Malouin, Paul-Jacques</td>
<td>1701-1778</td>
<td>Paris</td>
<td>Prof (Paris)</td>
<td>78; chemistry</td>
</tr>
<tr>
<td>Maret, Hughes</td>
<td>1726-1786</td>
<td>Montpellier</td>
<td>Pract (Dijon)</td>
<td>8; baths, epidemics</td>
</tr>
<tr>
<td>Menuret, Jean-Joseph</td>
<td>1739-1815</td>
<td>Montpellier</td>
<td>Pract (Paris)</td>
<td>80 +; medicine; jaundice</td>
</tr>
<tr>
<td>Montet, Jacques</td>
<td>1722-1782</td>
<td>Montpellier</td>
<td>Pharmacist</td>
<td>3; chemistry</td>
</tr>
<tr>
<td>Morand, Sauveur-Francois</td>
<td>1697-1773</td>
<td>Parisb</td>
<td>Surgeon</td>
<td>1; spleenwort as a diuretic</td>
</tr>
<tr>
<td>Penchener, Antoine</td>
<td>?-1761</td>
<td>Montpellier</td>
<td>Pract (Montpellier)</td>
<td>1; gout</td>
</tr>
<tr>
<td>Petit, Antoine</td>
<td>1722-1794</td>
<td>Paris</td>
<td>Prof (Paris)</td>
<td>1; human anatomy</td>
</tr>
<tr>
<td>Sanchez, Antoine-Nunes</td>
<td>1699-1783</td>
<td>Salamanca</td>
<td>Pract (Montpellier)</td>
<td>1; venereal diseases</td>
</tr>
<tr>
<td>Tarin, Pierre</td>
<td>1721-1793</td>
<td>Paris</td>
<td>Pract (Montpellier)</td>
<td>Many (337); anatomy, physiology</td>
</tr>
<tr>
<td>Troja, Michel</td>
<td>1747-1827</td>
<td>Naples</td>
<td>Prof (Naples)</td>
<td>5; medicine, tabia</td>
</tr>
<tr>
<td>Tronchin, Theodore</td>
<td>1709-1781</td>
<td>Leiden</td>
<td>Pract (Geneva)</td>
<td>1; smallpox inoculation</td>
</tr>
<tr>
<td>Vandesens, Urbain</td>
<td>?-1753</td>
<td>Paris</td>
<td>Pract (Montpellier)</td>
<td>Many (270); materia medica</td>
</tr>
<tr>
<td>Venel, Gabriel-Francois</td>
<td>1723-1755</td>
<td>Montpellier</td>
<td>Prof (Montpellier)</td>
<td>Many (707); chemistry, medicine</td>
</tr>
<tr>
<td>Villiers, Jacques-Francois</td>
<td>1727-1790</td>
<td>Paris</td>
<td>Pract (Paris)</td>
<td>20 +; chemistry, plates</td>
</tr>
<tr>
<td>Willemoz, Pierre-Jacques</td>
<td>1735-1799</td>
<td>Montpellier</td>
<td>Pract (Lyons)</td>
<td>1; phosphorus</td>
</tr>
</tbody>
</table>

Abbreviations: ca, circa; Pract, practitioner; Prof, Professor.

aNumber of contributions (if available) and topics or sections.
bMaster surgeon degree conferred.

Sources: References.8-10,18-20
Differentiate from the color induced by red sediment. Bloody urine may form clots or blackish filaments which cannot be redissolved in urine, whereas a reddish color due to sediment can be uniformly redissolved in urine. Having diagnosed the presence of blood, one should investigate its origin and causes. Of course, any lesion of the urinary tract (kidney, ureters, bladder, and urethra) can give rise to bloody urine. Blood originating in the kidney can be due to lesions of the vessels. In this case, it supervenes suddenly without pain, is abundant and well mixed with urine, and the color is uniform. Such bloody urine can occur because of inflammation or a stone, following physical effort, during horse riding, due to contusions, after a fall, or the use of cantharides. Symptomatic bloody urine may also occur with smallpox, rubeola, malignant fevers and more frequently with dorsal pleurisy. In such patients, bloody urine is hopeless and is a sign of a lethal disease. Indeed, bloody urine in no case is a reassuring sign.

[In bleeding from the ureters] urine is usually scarce in quantity and rich in gravel and small stones. Blood originating in the bladder is of small quantity, rich in blackish clots, and associated with strangury, hypogastric, and perineal pain. Blood mixed with pus, clots, and fetid smell is of bladder origin. A special cause of bloody urine is that due to tumors of the bladder neck, which are associated with great loss of blood. When blood is a symptom of a general disease, nothing should be done; when the primary disease heals, blood in the urine also disappears. Bloody urine due to stone can be cured by rest and use of emollients given as tisane, which are only palliative. Light decoctions of various plants are indicated.

"Diabetes," Translated From Encyclopédie, Volume IV

[Diabetes, a] disease due to urinary excretion of strong humors, is characterized by increased frequency of voiding and a urine volume greater than that usually observed in the healthy state. Urine is sweet, mixed with chyle, milky, purulent, and rich in liquefiable particles. Patients are thirsty, their thirst is not quenched by drinking. This is called true diabetes or also type 1 diabetes. A second type of diabetes exists, also known as false diabetes. In these patients, urine is clear, watery, in quantity equal to or in excess of fluid intake, and insipid. The difference between false and true diabetes is well known and goes back to Paul of Aegina, Galen, and Celsus.

Diabetes is different from incontinence, where there is continuous excretion of urine due to the loss of contractility of the bladder sphincter or to diseases which make it difficult or impossible for normal bladder contraction and relaxation. Diabetes is a consequence of an excessive quantity of humors which affect the urinary conduits and blood vessels, thus causing a continuous surcharge of watery, serous, chyloous, and milky substances. It should be distinguished from the excessive urine volume caused by use of diuretics and mineral waters; neither should it be confused with critical events like those associated

Figure 1. Position of the kidneys according to Albrecht Haller (1708-1777). Illustration from the Planches of the Encyclopédie, Table 75. Courtesy of the Bibliothèque Interuniversitaire de Médecine, Paris, France.
with the end of a fever. Factors predisposing to diabetes are excessive drinking of beer, Rhine wine, coffee, and acidic mineral water, and the use of diuretics, malignant long-lasting fevers, drugs that dissolve humors, all causes leading to obstruction of the viscera, and strong liquors. Some authors have attributed diabetes to a particular type of diarrhea affecting the kidney.

[Symptoms include] thirst, weakness, and hectic fever which may lead to death by consumption. In this respect, type 2 diabetes (false diabetes) is more frequent than true diabetes, and it is less dangerous. True diabetes associated with milky and chylous urine carries a greater risk since it deprives the body of nutrients, thus ending with consumption, in a time interval proportional to the amount of nutrients lost.

The therapy of diabetes should be centered on rein-

**Figure 2.** The nervous system and the kidneys according to Raymond Vieussens (1641-1715). Illustration from the *Planches of the Encyclopédie*, Table 64. Courtesy of the Bibliothèque Interuniversitaire de Médecine, Paris, France.
vigorating the renal vessels and abstaining from drinking. Perspiration should be promoted. Therefore, it is appropriate to stay in bed to promote excretion through skin, to avoid cold, and to apply dressings of warm cloth on the kidney. Tincture of cantharides may help in reducing urine volume. All the previous suggestions are particularly useful in false diabetes.

**COMMENTS**

As a “reasoned dictionary,” the Encyclopédie kept pace with the latest advances in medicine and the contributions of recognized scientists. Accordingly, the entries and illustrations of the kidney provide a good summary of what was known about kidney structure, function, and disease. The kidney structure and its illustration according to Anton Nuck is a tribute to this prestigious anatomist and internist at the University of Leiden, who is quoted by Haller in his *Elementa Physiologiae* 9 times; 4 on lymphatic vessels, 3 on stones, and 2 on the origins of urine. The kidney is still considered a secretory gland, but the section on urine formation almost alludes to and certainly anticipates the notions of glomerular filtration and tubular secretion. The term “filtration”
is used in describing urine formation in glomeruli and tubules. Credit is given to Marcello Malpighi (1628-1698), who thought that kidneys were made of glands and that urine secretion occurs only through them. The small arteries drain their fluid in a spherical cavity from which an excretory conduit is derived, which, in association with other similar conduits, becomes a visible uriniferous channel. [Herman] Boerhaave [1668-1738] favored Malpighi. However, for him, the most fluid part of urine is immediately drained in the ureters, whereas the most colored part is separated from blood through the glands. [Exupère Joseph] Bertin [1712-1781] followed the same hypothesis, without identifying his gland with those of Malpighi.21

The section on diabetes differentiates between diabetes mellitus and insipidus, which were just being distinguished from each other through the work of William Cullen (1710-1790) and Matthew Dobson (1732-1784).27 The entry on diabetes mellitus anticipates by a few years the work of Pierre Joseph Desault (1738-1795), who distinguished diabetes due to “humoral” causes, meaning chemical causes in the language of that time, from diabetes due to a renal cause.28

The Encyclopédie does not mention the studies on coagulable urine published in 1764 by Domenico Cotugno (1732-1784) in De ischiade nervosa commentarius,20 although the Commentarius also had been published in Venice in 1773 and in London in 1776, more than 50 years before the report of albuminous urine30 by Richard Bright (1789-1858). However, in the section on diabetes, mention is made that in true diabetes, a milky or chylous (nephrotic?) urine carries a greater risk of death.24

The renal entries of the Encyclopédie were influenced by those of Robert James in the Medicinal Dictionary,31 which was translated by Diderot.22 James, a medical graduate of the University of Cambridge who practiced in London, achieved fame with his Medicinal Dictionary, a competent compilation of medical knowledge.33 The entry on the kidney in the Medicinal Dictionary is more than 20 pages long and quite extensive, covering urine, its volume, and importance to diagnosis and prognosis, which James goes on to illustrate from his own observations and experiences. Some entries on medicinal plants, the kidneys, urine, and medical history in the Encyclopédie contain verbatim excerpts from the French translation of the Medicinal Dictionary by Diderot.22 Long sections borrowed from other texts were not an unusual phenomenon in the 18th century, when laws against it did not exist and plagiarism was not viewed with the sensitivity it is today.

CONCLUSIONS

Based on the excerpts translated here, it is possible to conclude that the Encyclopédie produced an accurate synopsis of basic and clinical nephrology. Selection of material was appropriate and kept pace with the most recent advancements, exemplified by reports on the studies of Exupère Joseph Bertin, Frederick Ruysch (1638-1731), Anton Nuck, and Albrecht Haller. The compilers also capably dissected the contributions of the various scientists, exemplified by the discussion on the achievements of Malpighi, Ruysch, Boerhaave, and Bertin. The illustrations were technically superb and re-drawn from the contributions of the most eminent scientists of the 18th century.

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