

Kent's Island, where Bowdoin College maintains a biological laboratory under the direction of W. O. Gross.

A powerful short-wave radio station, VEIN, is maintained on the island, in charge of Thomas Gross and a corps of operators. This was made available for the project in sound-recording.

In burrows dug in the loose soil a mile from the laboratory among the rocks on the outer slope of the island nests a colony of Leach's petrels. The petrels are nocturnal in their habits, and a strange concert arises from the mouths of these burrows before the males go in search of food for the young.

### Frog-Like Chorus

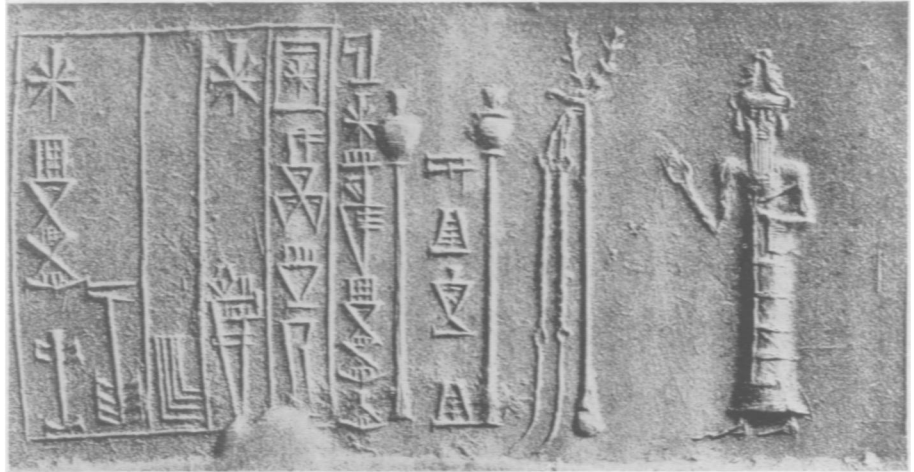
Mr. Brand wished to get an accurate record of this frog-like chorus of bird voices. Faced with the impossibility of getting a sound truck to the island, the expeditionists laid a mile of telephone wire from the radio station to the petrel colony. The sensitive microphone with its parabolic reflector used by Mr. Brand in his sound recordings was attached to the end of the telephone line. A new portable field amplifier developed by Prof. True McLean and Paul Kellogg of the laboratory of ornithology, which could be carried easily over the rocks, amplified the petrels' song sufficiently so that it could be sent to the radio station.

As the petrels stood at the entrances of their burrows or wheeled about overhead giving their croaking notes, the microphone picked up the sounds and with the aid of the amplifier sent them to the radio station, whence they sped across the intervening six miles of the Bay of Fundy to the sound truck waiting on the island of Grand Manan. In the sound truck the electrical waves set up by the voices of the birds caused a tiny galvanometer to deflect a ray of light on the edge of a motion picture film which shot past the vibrating light at the rate of 90 feet per minute.

Listening to the developed film as it was played through the reproducer in Fernow Hall at Cornell, Prof. Arthur A. Allen reported that not only the voices of the petrels were recorded successfully, but many other sounds that emanate from Kent's Island at midnight were gathered in and permanently recorded on the film.

The voice of the European nightingale has been broadcast a number of times from gardens near London, England, but this is believed to be the first time that the voice of any bird has been recorded on film by means of radio.

*Science News Letter, September 4, 1937*



### SIGNATURE

*Doctor Ur-Lugal-edina of Babylonia signed his name in this odd style, 4300 years ago. He had the whole signature on a personal seal, so it was no trouble.*

ARCHAEOLOGY—GENERAL SCIENCE

## Babylonians Merit Honor as Original "Fathers of Science"

By DR. WALDO H. DUBBERSTEIN  
The Oriental Institute, University of Chicago

**A**SSUREDLY the ancient Babylonians deserve the title "Fathers of Science."

Through 3,000 years of documented history we can trace their slow steps toward modern science. We today have no reason to feel smugly superior in our advanced knowledge. The really hard steps in progress are the first ones. Those were taken for us thousands of years ago.

Four thousand years ago, Babylonian surgeons set broken bones, made major and minor body incisions, and even attempted eye operations. A pictorial representation shows the physician with his inevitable case and bandages.

Sicknesses were known by specific names, and symptoms were recorded. Magical and religious elements of Babylonian medicine are easily overemphasized, while honest medical prescriptions are overlooked. There is a reasonable purpose in Babylonian magic. Once gods and demons had been accepted, then charms and incantations for their control were also necessary. Had magic been omitted, the patient would certainly have lacked confidence in his physician. It was part of his professional "bedside"

technique. But scores of simple medical prescriptions have no magic in them. Some even have real medicinal value.

Mathematics was obviously practical in a complicated business development such as Babylonia experienced almost 5000 years ago. Ancient textbooks offer simple and complex problems, such as:

"A square of 356 yards has been divided into eight triangles; compute their areas," and "Given a rectangle whose width is 10 yards, and whose length is 40 yards, compute its diagonal." Two distinct solutions are offered by the author of the textbook for this last problem, both of which reveal a small margin of error.

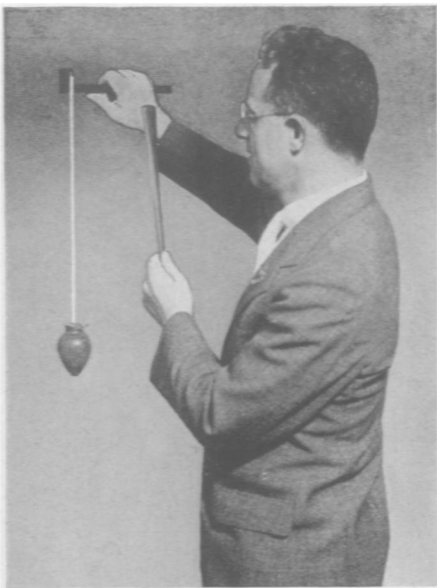
In the oldest texts are found addition, subtraction, division, multiplication, and fractional numbers. Square and cube root tables, as well as multiplication tables, were also compiled. Even the theorems commonly ascribed to the Greek Pythagoras and Thales, who lived in the sixth century B. C., seem to have been known, empirically at least, in Babylonia 4,000 years ago.

Astronomy began its climb toward a respectable science as an assistant to that pseudo-science, astrology. Yet by 2000 B. C. Babylonian astronomy had assumed much of its later form as a practical science. Days began with the setting sun,

months with the new moon, New Year theoretically with the spring equinox. The necessary adjustment between the lunar and the solar year was made by inserting extra months. All this demanded specific astronomical information. The path of the sun through the heavens had been charted through the twelve constellations, whose names still survive in our zodiac. At least 71 stars were carefully studied and named.

Astronomy made real scientific progress during the last millennium before the Christian era. Solar and lunar eclipses as well as heliacal risings were now accurately predicted. The precession of the equinoxes may have been recognized, and the tropic year was distinguished from the sidereal. And so Babylonian astronomers are now accorded long overdue honor for accomplishments commonly attributed to Greek astronomers.

Progress in biology was not so pronounced as in astronomy, but elementary steps were taken. Long lists of animals, ordered in divisions and subdivisions, reveal an active interest in the living world. When fish are grouped with clams or eels with snakes we may not agree with the classification, but we understand the reasoning. More than 400 distinct plants and trees had been identified and named by these ancient scientists.



*Babylonia's wise men used instruments like this for sighting, when they observed the celestial bodies. The instrument shown belonged to Egypt's famous king, Tutankhamon.*

Geographical knowledge was certainly inadequate and restricted, in ancient Babylonia. But there was interest in accumulating data on distances between cities, and descriptions of regions. City plans are sometimes so carefully drawn that they are of actual help to modern excavators. One ambitious Babylonian geographer produced a "world" map which plainly shows that there were still many worlds left for him to explore.

Chemistry as a science developed out of practical needs and practical experiences. Metal smelting was practised before written history, more than 5,000 years ago, and it was through experimentation with fire that early man learned much about the properties of many minerals. About 120 minerals are recognized in Babylonian lists. These were distinguished and classified accord-

ing to various standards, such as use, color, hardness.

Detailed formulas for making various kinds of glass are preserved. A recipe for lead glaze colored with copper is dated 3,500 years ago. Aside from practical uses for chemistry, Babylonians also interested themselves in the ever fascinating problems of producing gold from baser minerals and the manufacture of synthetic precious stones.

It was their practical compilation of observed phenomena, as well as their discovery of general truths, that made the Babylonians pioneering scientists. One hundred years of exploration and research in the field of ancient Near Eastern history have yielded such astounding results that today it is unwise to speculate on the further capacities and resources of these early people along any line of human endeavor.

*Science News Letter, September 4, 1937*

#### PSYCHIATRY

## No Sex Crime Trivial, Says Physician, Urging Mental Care

### Asks Examination of All Convicted of Such Crimes; Many Guilty Are Seriously Ill, Government Psychiatrist Declares

**M**ENTAL examinations of all persons convicted of sex crimes would meet with the approval of physicians who specialize in the treatment and study of the mentally ill. Such a plan as that proposed for New York City is considered a step in the right direction.

Many of those guilty of such offenses are seriously ill mentally, says Dr. John E. Lind, in charge of the criminal insane at St. Elizabeth's government hospital at Washington, D. C. Although very little can be done toward curing the sexually abnormal adult, it is very important that they should be segregated for the protection of society and should be given medical care.

Those guilty of sex offenses usually are in one of three groups, Dr. Lind explained. First, the feeble-minded are frequently guilty, not that they are sexually abnormal, but they lack the intelligence to control their behavior and the initiative to find in marriage a socially acceptable outlet for their sex impulses.

Another group are old men who are becoming senile; like the feeble-minded they are not responsible, and cannot con-

trol themselves. The third group are the truly sexually abnormal; although such persons may go through life without doing anything publicly that would get them into trouble with the law, they are always a potential danger and may at any time be guilty of serious crimes against innocent persons.

Sex crimes against children are not, medically speaking, different from those against adults. Children are the victims with pitiful frequency because they are so helpless, because they are easily lured away into sequestered places and because they would not be able to betray the attacker by an accurate description or might be silenced by threats.

No sex crime is considered trivial by the physician. Although an attack upon a child arouses a much greater public resentment and results in more serious legal punishment, those other offenses that are usually dismissed with a five dollar fine in police court—those of the "masher" type—are just as serious to the physician because they are symptoms of sexual abnormality which may just