

Discovery

About the Cover



CELEBRITY OF THE MONTH

Luigi Aloisio Galvani

279th Birthday, (September 9, 1737 – December 4, 1798)

Discoverer of animal electricity

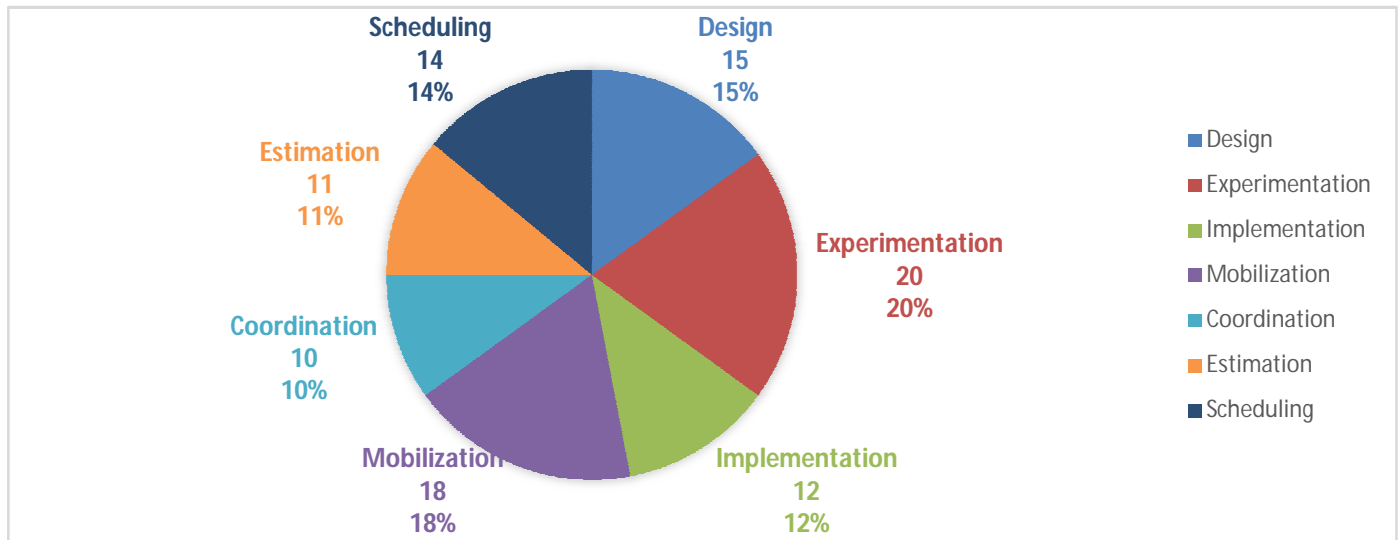
Pioneer of bioelectromagnetics

Luigi Galvani was born in Bologna, Italy, on September 9, 1737. He was an Italian physician who discovered the animal electricity and he is recognized as the pioneer of the bioelectromagnetics. He demonstrated the electrical basis of nerve impulses when he made frog muscles twitch by joining them with a spark from an electrostatic machine. Further experimenting with natural (i.e. lightning) and artificial (i.e. friction) electricity, he concluded that animal tissue contained its own innate vital force, which he termed "animal electricity." Galvani proved that the electricity did not emerge from the animal tissue itself, but from the effect produced by the contact of two different metals in a moist environment (a human tongue, for instance). Galvani devoted most of his early scientific efforts to anatomical topics. His first publication, in 1762, was a dissertation on the structure, function, and pathology of bones. He described the chemical and anatomical elements from which bones are constructed, their pattern of growth, and various diseases to which they are subject. In 1767 he published an essay on the kidneys of birds, in which he described, among other things, the three-layered ureteral wall and its peristaltic and antiperistaltic movement upon irritation. Galvani also devoted several papers to the anatomy of the ear in birds, just before Antonio Scarpa published on this subject. He recounted with particular precision the comparative anatomy of the auditory canal in several species of birds, devoting some attention to the distribution of blood vessels, muscles, and nerves in the middle and inner ear. Galvani opened the way to new research in the physiology of muscle and nerve and to the entire subject of electrophysiology. He died on December 4, 1798 in his childhood house in Bologna at the age of 61 (Image: <http://asktheleagueofnerds.com/>).

CASE STUDY

Non-Revenue Water (NRW) is a challenge for Global Water Supply System Management: A case study of Dhaka Water Supply System Management

Farok GMG



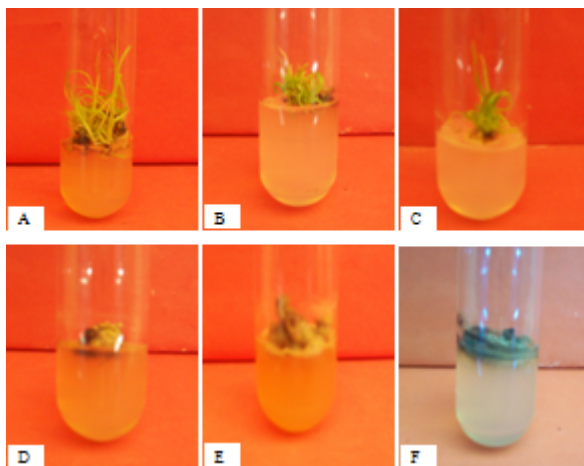
Non-revenue Water (NRW) is an important component of commercial water system management. NRW is the result of pipelines leakage, improper, illegal service connections and theft water. NRW contributes system loss that is a buzzword. Actually, NRW is uncounted water that has been produced but it is confirmed to be "lost" before it consumes the customer. This matter agitates for all concern and specially it affects the whole economy. Dhaka Water Supply and Sewerage Authority (DWASA) is one of the main utilities in Dhaka City and it is the most important sector of the Government of Bangladesh. The potable water distribution network has been installed at the whole area of the city and it covers periphery of the city and its extension is going from N. Gonj to Tongi as well as surrounding area of this city. Non-revenue water surveys were conducted on specific fields and areas that were selected randomly. It would be gradually becoming a serious issue affecting the interest of all concerned and would be one of the major crises to be solved with techno-managerial concept.

Discovery, 2016, 52(249), 1668-1676

ANALYSIS

Effects of sodium azide on callus in sugarcane

Kuasha Mahmud, Nasiruddin KM, Hassan L



The experiment was conducted at the Biotechnology Laboratory, Bangladesh Sugarcrop Research Institute (BSRI), Ishurdi, Pabna, Bangladesh. The effects of different concentrations of chemical mutagen sodium azide (0, 1, 2, 3, 4 and 5 mg/l for 5 days treatment) on callus of sugarcane varieties Isd 37, Isd 39 and Isd 40 were investigated under in vitro aseptic condition. The highest number of

shoots 34.64% was decreased over control (without treated callus) of Isd 39 followed by Isd 37 (25.75%) and Isd 40 (the lowest 21.85%) respectively due to treated by sodium azide (NaN₃). The plantlets regenerations were developed by sodium azide (1-2 mg/l) treated calli derived from MS medium supplemented with 2, 4-D (3 mg/l) containing 10% green coconut water. This is first research work of chemical mutagen sodium azide on callus of sugarcane in Bangladesh.

Discovery, 2016, 52(249), 1683-1688

On realization of servo-constraints, imposed on the corrected gyrocompass in its Nutational motion

Teshaev M Kh

$$\Delta_3 = \kappa_1 \kappa_2 \kappa_3 (\kappa_2 + \kappa_3) + \kappa_1^2 \kappa_3^2 (\kappa_2 + \kappa_4) + \kappa_1 \kappa_3 \kappa_4 (\kappa_1^2 - 2\kappa_2) > 0$$

On this paper the realization problem of servo-constraints, which is imposed on a gyrocompass to be corrected is considered. The equations of motions of a corrected gyrocompass in its nutational motions are received. For realization of servo-constraints, imposed on a corrected gyrocompass, it is offered to construct digital watching system (DWS) and the laws of formation of operating influences are defined out of the full system of equations of DWS. The conditions, at which steady realization of parities of servo-constraints is provided, will be received.

Discovery, 2016, 52(249), 1692-1701

Application of discriminant analysis in modelling students' placement in colleges of education

Bakari HR, Isa AM, Zannah U

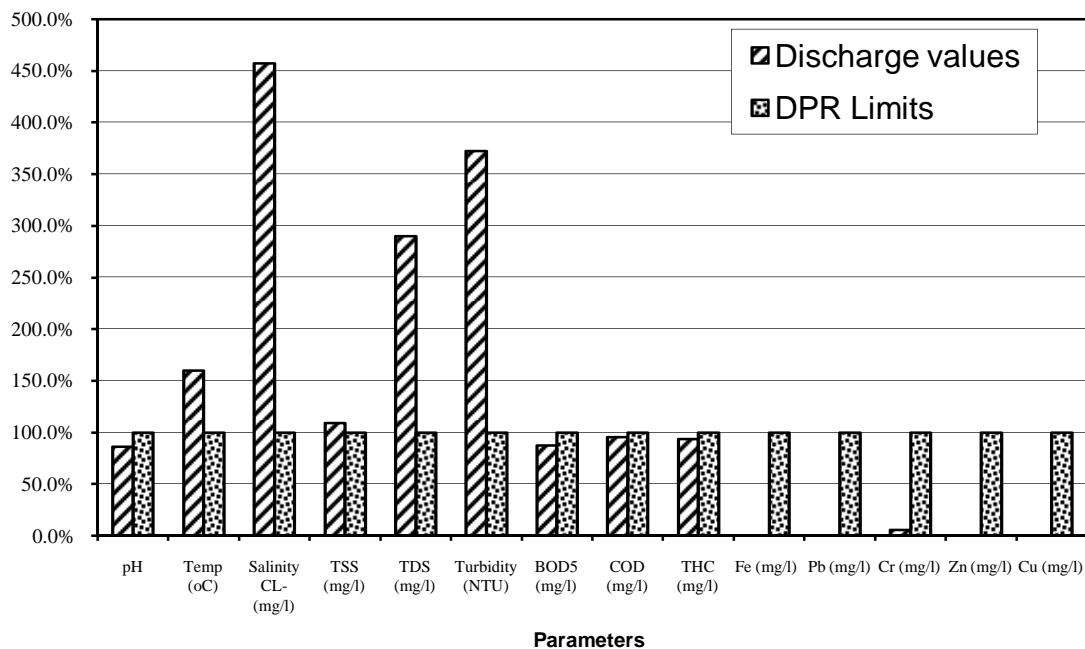
$$Z_{jk} = a + W_1 X_{1k} + W_2 X_{2k} + \dots + W_n X_{nk}$$

This research designed a predictive model for the purpose of placing incoming students from the Pre-Nigerian Certificate of Education (Pre-NCE) programmes into courses of study based on the students' performance at the Pre-NCE level. A Discriminant function was constructed to each course combination. The classification model sought to assign students into courses of study through the analysis of subject scores at the Pre-NCE level using Discriminant analysis technique. The results obtained indicate different subjects in different courses as the strongest contributors for the placement of students into different subject combination.

Discovery, 2016, 52(249), 1702-1707

Performance evaluation of a produced water treatment plant in a crude oil production facility

Howard IC



The present study which was carried out (on a facility that is located on Latitude 04° 35.52'N and Longitude 08°25.45'E) using standard method of analysis monthly for two years has demonstrated that the treated produced water discharged from the crude oil processing into the near shore environment is 63.6% (each for both years) efficient when compared with the Guideline limits of the

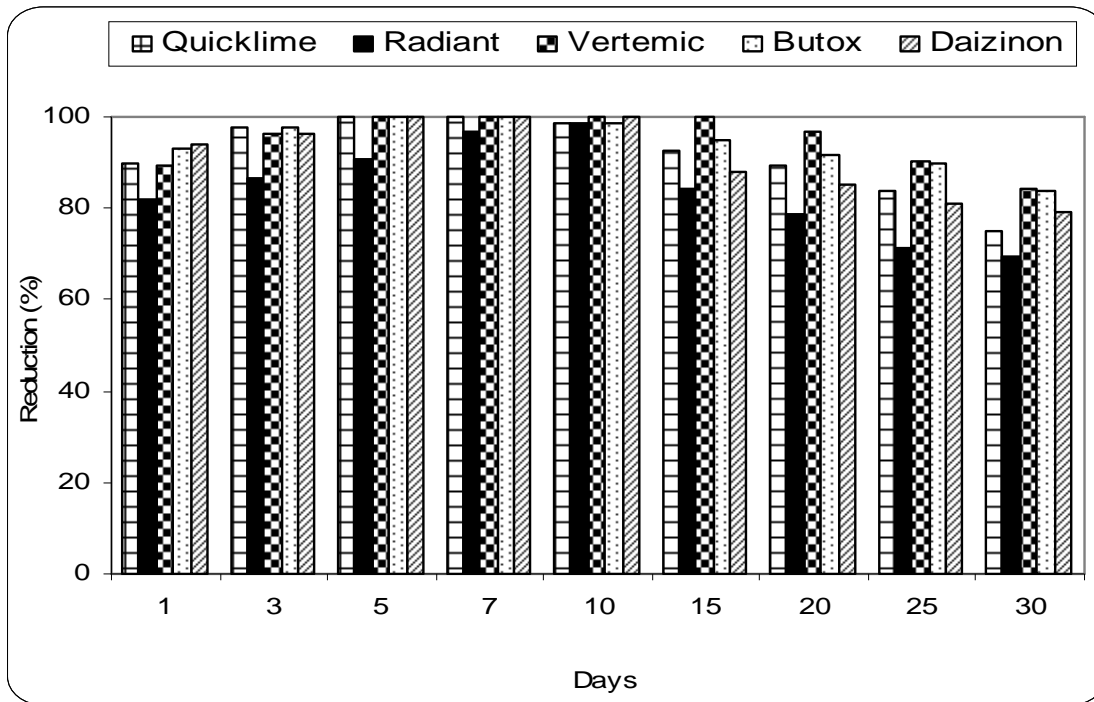
Regulatory body (Department of Petroleum Resources [DPR] of Nigeria). Out of the fourteen parameters investigated temperature, salinity as chloride, total suspended solids, turbidity and total dissolved solids were above the regulatory limits. There is therefore need to add additional polishing technologies to further reduce these parameters before discharging into the aquatic environment. Due to cost implications of such high technologies there is need for the operators to routinely clean up their existing produced water treatment plants so as to meet 100% efficiency of the regulatory body to maintain a sustainable environment.

Discovery, 2016, 52(249), 1713-1720

THESIS

Studies on Certain Ectoparasites Associated with Some Farm Animals and their Control

Abd El-Aleem Saad Soliman Desoky



The present work was carried out on animal ectoparasites during the period from 2007 to 2010 in Animal farm of Assiut University. The study included the population survey of ectoparasites on animal bodies, soil and associated rodents and controlling the animal ectoparasites. Results indicated that there is a difference in ectoparasites depending on animal kind, e.g., ticks on cattle, lice on buffalo and fleas on sheep, and the relationship between rodent and animal ectoparasites was assessed. Also, the population density of ectoparasites was increased in spring season and reduced in winter season except fleas on sheep which its population density was increased in winter season and reduced in summer season. Mechanical and chemical control can be used to reduce animal ectoparasite populations and worked as a good tool in the program of ectoparasite control on animal bodies, soil and control of rodent species.

Discovery, 2016, 52(249), 1727-1932